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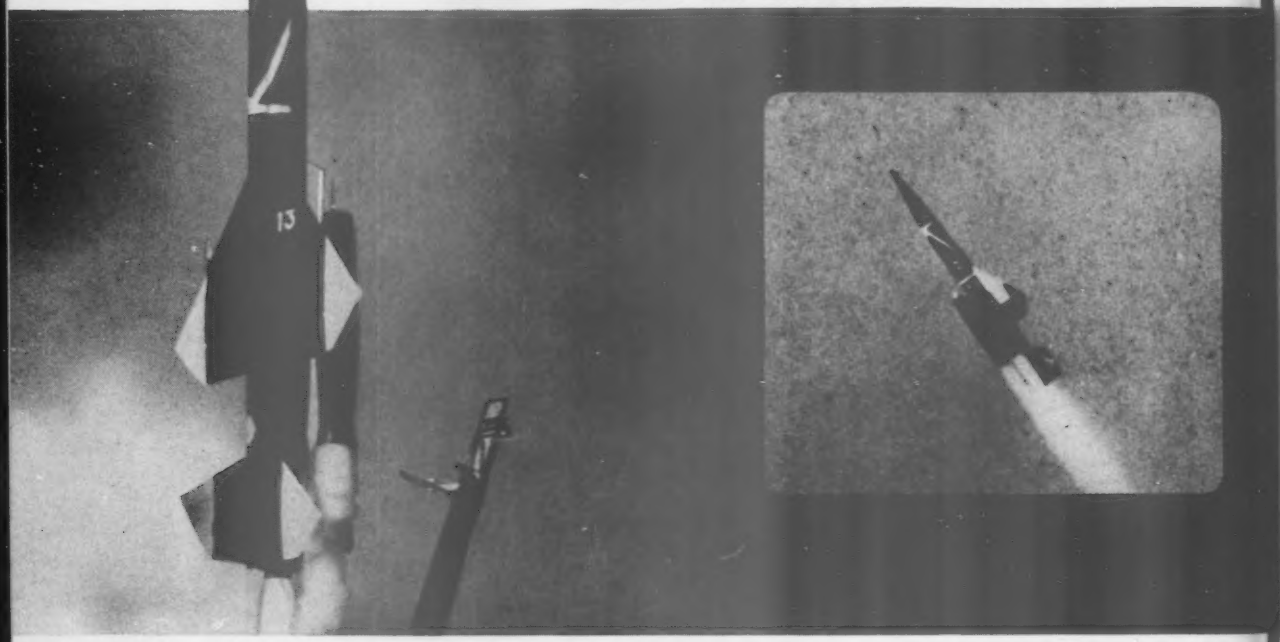

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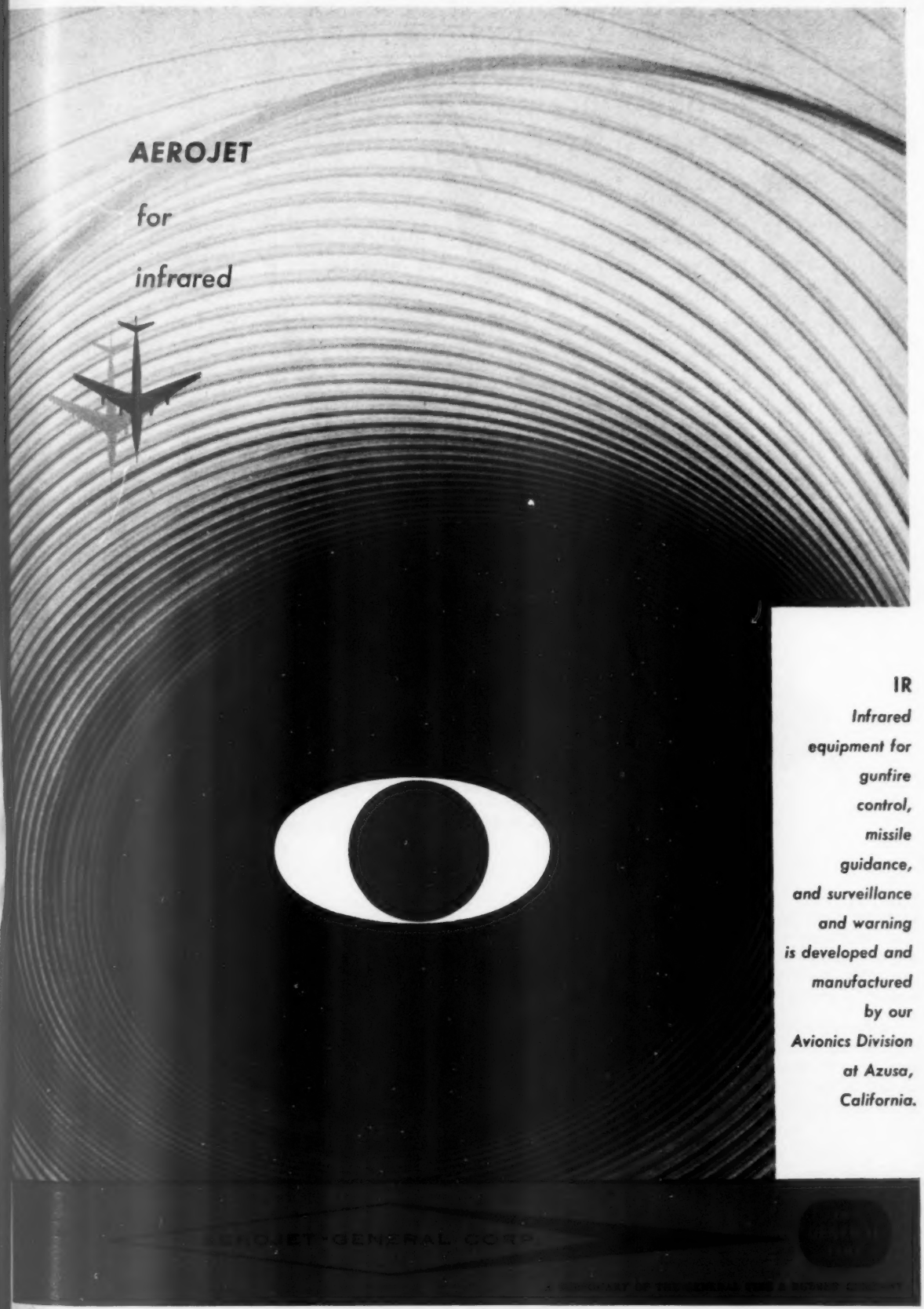
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ARMED FORCES management

PUBLISHED FOR THE ARMY, NAVY, AIR FORCE, COAST GUARD AND MARINE CORPS

MARCH, 1958

Mobile Fleet Depends on Effective Supply Planning 8
Rear Admiral R. J. Arnold, Chief of Bureau of Supplies and Accounts, tells why.

Logistics Readiness 12
Lt. Gen. Irvine, Deputy Chief of Staff for Materiel, outlines a new twist to an old idea.

Army Logistics Planning for the Future 17
Lt. Gen. C. B. Magruder, Deputy Chief of Staff for Logistics, looks five years into the Army's future.

Why a Military Subsistence Supply Agency 27
Maj. Gen. McKenzie describes what the MSSA job is and why.

The Technical Publication Manager 29
Roswell Ward, in the first of a series, outlines the pitfalls in the operation of a $600 million a year budget item.

The PX in Perspective 31
Maj. Gen. H. C. Parks, USAF, answers the PX criticism by private retail associations in an exclusive story.

Where Leaders Find Ideas 34
Lt. Col. W. H. Hunt, AGC instructor, presents some clues.

How to Handle Records at Half the Cost 35
MATS bought some new equipment and halved their costs. This is how it was done.

The Scope of Modern Army Logistics Management 36
W. J. Garvin, the Army's Deputy Director of Financial Operations, tells what it covers and why it is important.

Package Properly or Perish 39
Col. Lloyd G. Hanley points up the importance of an overlooked phase of logistics.

Are You Wasting Money on Noncurrent Records? 40
R. B. Barker gives some clues on how you can save.

Let's Take the Mystics Out of Logistics 44
Major Charles Davis, USAF, says the word itself means too many different things to too many different people.

Manpower—From Source to Uniform 46
C. S. Rice outlines the Air Force recruiting technique.

Departments

Editorial 5
In My Opinion 7
Washington Background 16
Research and Development 22
Personnel Preview 24
Pentagon Profile 26
Dates to Circle 30
Procurement and Logistics 32
Professional Services 45
Your Investment Future 47
Advertisers' Index 48
New Products 49

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ARMED FORCES MANAGEMENT **Volume 4—No. 6**

Published monthly by Professional Services Publishing Company, a subsidiary of American Aviation Publications, Inc., Washington, D. C. Printed at The Telegraph Press, Harrisburg, Pa. Accepted as controlled circulation publication at Harrisburg, Pa. and Washington, D. C. Copyright 1958 by the Professional Services Publishing Company. Title registered U. S. Pat. Off. Four weeks' notice before next publication date required for change of address. Subscription Rate: One Year—$2.00; Two Years—$3.00; Overseas, One Year—$3.00; Two Years—$5.00.

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CONTINENTAL IS ON THE MOVE IN 195

EDITORIAL

Public Understanding and Military 'Excesses'

ONE of those sensational newspaper stories which seem so often to be frying the Defense Department hit the papers again recently—and indicated once again that the general public really has been told very little about the problems of military logistics.

The story went this way:

"The Senate Permanent Investigations Subcommittee yesterday urged a world-wide investigation to determine the extent of waste and duplication at USAF installations. The recommendation stemmed from the subcommittee's report on the Northeast Air Command, where it uncovered $34,680,000 in 'excesses' last year.

"Investigators also urged the Air Force to establish a 'centralized control of supply and logistics' in the Pentagon. It called upon AMC to conduct periodic inspections of all major Air Force installations and file findings with DOD in Washington."

If true, that is a great deal of excess. It amounts to almost two-tenths of one percent of this year's Air Force budget.

The distressing thing about such an over-procurement situation, if true, is not the fact that it happened at all (which is always the way such stories are written) but rather, it is surprising that it doesn't happen more often. Instead of being called on the carpet for such "glaring waste," military supply people should really be praised for keeping excesses to a minimum. But, of course, then there would be no story.

Unfortunately, such a story will not do what it is intended to do: presumably, serve as a prod to keep Air Force procurement people working efficiently. Certainly, if such a situation exists, the Air Force is already aware of it, and more unhappy than anyone else because it happened. Misspent money means just that much less available to buy planes and missiles and support equipment. The story serves only to undermine further public confidence in the military. It is told to people eager for information by groups whose very statements indicate they don't understand fully what they are talking about.

The management of military logistics is a difficult story to tell. But, unless the Services want to remain perennially on the defensive, it is well past time for them to start telling it. With the nation's headlong rush into space, the running of military supply programs is becoming extremely complicated. Errors of over-procurement or under-procurement become more and more likely. The Services will continue to look bad in such stories until they put on a concerted effort to tell people what the problems of the military logistician are and what is being done to solve them.

The obvious, and most used, retort to charges of "waste" is that percentage-wise against the total budget this waste usually doesn't amount to much. But this is, for the most part, lost on the taxpayer who knows only that $34 million is a lot of money and $18 billion is just a lot more.

Some of the information left unsaid:

Whole new families of weapons are being built into the military arsenal. There is, at present, no reliable way of knowing just how much support equipment, spare parts, etc., these weapons will require. There is no maintenance experience on an operational basis. In many cases, the Air Force, for instance, has to rely on the contractor's recommendation. But it is only a recommendation and can be wrong.

With only one supplier of an item, say the B-52, the Air Force has to buy spare parts when the company is making them in production (or else pay a high fee to have the company tool up to fill orders when it is not in production). So the Air Force orders during, possibly, March and April (even though it has plenty of the item on hand) because it knows that nine months from now it will need the parts and the company won't be making them.

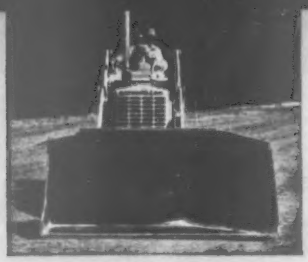
Then comes the hooker. Procurement is a direct reflection of current and future plans for strategy and tactics. Procurement people must estimate the life of a particular weapon and buy to maintain that weapon until it becomes obsolete. So, after buying all this equipment, a development breakthrough may occur a year sooner than anticipated. (This just happened with Polaris, although it is not in the operational stage yet.) And the arsenal built up for the "old" weapon becomes "excess."

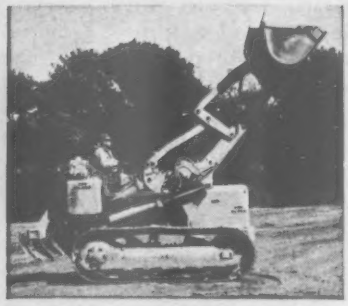
Modifications and improvements in weapons are constantly being developed. The supply people could not possibly have known what they were going to be when the first parts orders were placed. The improvements eliminate or modify existing components. So, suddenly, the Air Force has a certain type of wing tip but nobody is making the aircraft that uses it any more. And we have another "excess."

There are 1,304,000 items in the Air Materiel Command inventory list alone. Is it reasonable to assume that in 1,304,000 evaluations of how much is going to be needed there will be 100 percent accuracy in forecasts?

It is difficult to keep the flow of reports into AMC headquarters, as an example, current with the actual build-up or depletion of base inventories. Often the supply manager doesn't know until the situation hits him in the face that a certain base is buying too much of a certain item. Electronic Data Processing control will improve this but the Services are still at least two years away from really setting this up.

The point to be made here is that none of these situations (which are only samples) has been effectively presented to Congress and the Public and it is past time the Services did something about it.

Here  comes...

the TRAXCAVATOR'S  new...

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In My Opinion

More Pay Rebuttal

I wish to refer to the type of argument against improved pay incentives for military personnel that was exemplified by the letter of Colonel L. B. Kuhre, USA (Ret.) in your January 1958 issue.

Contrary to Colonel Kuhre's contention that competition between industry and military personnel requirements is out of the question, it should be the most logical time in history when military personnel vacancies would justify *overwhelming* competition with industry. This conclusion is based on the following:

a. Personnel turnover is the gravest problem in the services today.

b. Never in history has industry produced more complicated, more expensive or more lethal weapons and machinery of war. Certainly, the *USERS* of this hardware are as important as the *PRODUCERS*, and, after all—let's face it—money is one of the key ways of emphasizing personnel importance in our economy.

Arguments about the need for generalized improvements in the "human relations"—"structure of organization"—and the like have been called out for too long a time without effect. The best of all improvements in the "human relations" factor of military life would be to restore the dignity of the military profession. The first step in so doing is to increase pay drastically. It is idiotic that a young jet pilot, entrusted with a multimillion dollar aircraft and its lethal cargo of special weapons, receives less pay than a Greyhound Bus driver. It is even more ridiculous that the pay of Generals and Admirals is many thousands of dollars less than the average "junior" executive.

It seems paradoxical that the Colonel should criticize the Cordiner Committee Report for concluding in favor of higher pay incentives when that Committee was made up of men who represent the best minds in industrial management.

Your Editorial Note nicely pulled things back to reality in pointing out that the citizen-soldiers are now striking primarily for more pay—*because they are.*

J. E. Hart
Captain, U.S. Navy

Military Organization

Please accept our sincere thanks for your courtesy and generosity in permitting the U.S. Army Command and General Staff College to include in the Military Organization and Management course the material that we requested, to which you hold the copyright.

The course is doing much to interest students in organization and management—a field so important to the military man. This interest is heightened by your contribution of excellent material.

George D. Jacobson
Lt. Col., Armor
Department of Staff and Educational Subjects

Industrial Programming

The article "Industrial Programming Needs Improving" by George Mundorff and William Bloom in your January '58 issue interests me to the point of perhaps a "look see" for direct application of this technique.

If I may be able to write or see these gentlemen, it would be very valuable in my daily work in the R&D field.

John G. Muzulla

Write either man care of Detroit Controls, Norwood, Mass.—Ed.

Required Reading

Col. Kowalski's article on "Delegate—Don't Deputize" wields a surgeon's scalpel on an obvious problem. With quick, incisive strokes he gets to the root of a problem which we all know to be true—but which we hesitate to mention.

My congratulations to you for printing it—and I might add, congratulations for turning out an excellent magazine which should be required reading for all in the military.

May we have more articles such as this by Kowalski!

Capt. Robert J. Wood
Chaplain USA

Bouquet

This is just a note to compliment you on the recent issues of ARMED FORCES MANAGEMENT which have presented in fine fashion information concerning the Navy's management structure; particularly the November '57 and January '58 issues.

I have heard many favorable comments within the service.

C. C. Kirkpatrick
Rear Admiral, USN
Chief of Information

Defense Handbook

Thank you very much . . . for the special reference issue of ARMED FORCES MANAGEMENT. It is a well organized and most useful publication.

A. C. Burrows
Captain, U.S.N.
Commander, Naval Training Center
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The goal of the Navy supply system is a relatively simple one. It is to make sure our ships can operate anywhere, anytime, anyplace. This means that material and equipment in sufficient amounts must be furnished to the fleets so they can maintain constant vigilance and, if necessary, convert to immediate wartime operations. This means that a

Mobile Fleet Depends on Effective Supply Planning

by
Rear Admiral R. J. Arnold, SC, USN
Chief, Bureau of Supplies and Accounts

ACTUALLY, though, this is a big order with tremendous responsibility. It requires an organization which must be extremely responsive to the demands of ships sailing the oceans, as well as the inter-related shore establishments which are part of the network of supply.

The concept of today's logistic support reflects the Navy's idea of fleet mobility with its concomitant recognition that ships must be widely dispersed as part of the national defense policy. The Supply Corps, under the Bureau of Supplies and Accounts, is keenly aware of the "mobile fleet" and has focused its attention on making our combat ships as self-sufficient as possible.

What does this self-sufficiency entail? Well, it means the fleet must be supplied with certain necessities. For the ships and planes this means fuel, repair parts, tools and many other technical and non-technical items. For the men, this will mean clothing, food and even such items as cigarettes and tooth paste. All of this material must be moved out to the operating ships in the proper proportion, at the right time, and with minimum disruption to the ships' combat readiness.

The job of supplying the fleet involves many logistical operations covering procurement, shipment, storage and distribution of large and small supplies such as food, technical repair parts, fuel, clothing and also items sold in Navy exchange stores. The Bureau, in addition, controls the operation and administration of cargo handling battalions, cargo terminal facilities, together with the loading and unloading of cargo ships and tankers.

The principal object of all our supply support is directed toward providing the combat ship with adequate spare parts, provisions and fuel to cope with any situation. With the possibility always present that our ships might be called upon to deploy at unexpected times, we want them to be as self-sufficient as possible. Part of this self-sufficiency is accomplished by maintaining certain repair parts and consumables aboard at pre-determined stock levels for routine repairs and limited emergencies.

Each ship has a Ship's Allowance List, which is different, reflecting as it does the parts needed to repair specific machinery and equipment aboard. The list guides the supply officer by giving him a valid prediction of what the ship needs to keep in fighting trim. As newer equipment supersedes older equipment, changes are posted to keep the list up-to-date.

The combat ship usually has very limited space to devote to spare parts stowage or for food provisions. The limitation is met, in part, by further supplementary help from the "floating warehouses" which accompany the fleet and can give on-the-spot assistance. The issue ships carry different categories of material and by underway replenishment techniques developed during World War II, the combat ships can be re-supplied without returning to shore supply depots.

The advantages of movable supply centers are readily apparent. If the fleet is ordered to any particular area, our supply support can go right along with it, greatly reducing the dependence on land-based facilities. While moving to the next objective, our ships can be absorbing the new supply stocks by at-sea transfers.

Underway replenishment is one of our most important techniques for wartime operations. Even now we stress this by continually practicing the at-sea supply operation. Under wartime conditions, of course, our program for underway replenishment must take into consideration supplies available at advance bases or floating centers. There are many factors to consider, but all must be balanced if the total effect is to strengthen the fleet's striking power.

In planning any wartime operation, we have to weigh such questions as:

(1) Estimated duration of a campaign.

(2) Availability of mobile support and underway replenishment ships.

(3) Capabilities of available and usable advance supply bases.

(4) Condition of weather, water and geography.

(5) Enemy capabilities directed

against our supply line.

(6) Logistic feasibility and economy. All of these points must be determined before we can fix the supply support plan for the fleet. It adds up to a complex problem which is being studied and resolved by our supply management people.

Behind the whole concept of our logistic supply planning lies the basic fact that we have to adapt to sudden changes in fleet operations. During wartime the supply line must be flexible and elastic, responding to our ships' needs as they exploit enemy weaknesses, advance or change operational dates, sustain enemy damage or are hampered by bad weather.

Transporting the supplies out to the ships is done principally by means of surface channels. Air is used primarily for emergency or critical items. However, we have been using air transportation to the extent it is made available to us.

The "fanning out" of supplies to the individual ships is greatly facilitated by the Carrier Onboard Delivery (COD) air service, which flies airlifted material from shore bases to aircraft carriers. Subsequent delivery to other ships can be made by helicopter or routine underway transfer.

At any one time the supply system must be able to meet any request for many different types of materials. Everything has to be procured, stocked and issued before delivery to the fleet can be effected. Many functions are coordinated, from stock control, to transporting material to supply depots, to the storage and eventual inclusion in a shipment destined for a combat ship.

To meet the supply and demand, the Navy supply system has 14 controlling offices which provide actual inventory management over specific categories of materials. Eleven of these are known as Supply Demand Control Points (SDCP's) while the other three control offices are "retail management offices" operating in material areas which are now covered by the Single Manager system. The Supply Demand Control Points do not, it should be emphasized, stock parts. They are the regulatory points which determine the flow of materials to the supply center, depots, shipyards and major naval air stations. The SDCP's control the material flow, but they do not have any management control over the storage operations of the field activities.

Primarily, each supply control point is responsible for:

- Determining requirements. That is, how much is going to be bought.
- Procuring the material. Also determining excess material, if any.
- Distributing the items. Shifting material from one stocking point to another to meet consumer demand.
- Budgeting for procurement of future items.
- Cataloging material. That is, giving each item a stock number and summary description.

Supply Demand Control Points also exercise control functions such as designation of stocking points, establishment of requisitioning procedures, preparation of outfitting allowances and determination of storage requirements.

Inventory managers at the control points have to be alert to the changing economic scene, as well as to the supply and demand of material under their control. Information obtained from the distribution points is used to help them predict requirements and maintain the stock level consistent with economy and need.

The flow of material goes by rail, truck, water and air. Without an efficient transportation system here, our supplies would not be getting out to the ships. Traffic management has done wonders in moving vast mountains of supplies when and where needed. By good transportation and careful management we can move faster and quicker, thus enabling us to maintain smaller inventories.

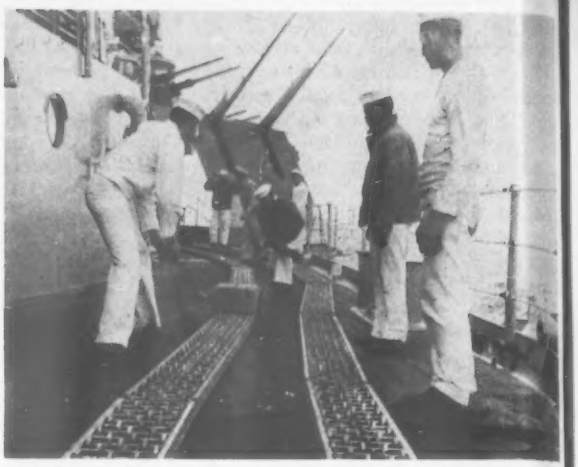
Naturally we are interested in keeping our ships in top-notch shape. But we are just as interested in making sure our men are well-supplied with the best clothing and food we can obtain. The Navy has made great strides in developing ration-dense foods which save space, save time needed for food preparaion, as well as to simplify its preparation, without impairing its quality. Special clothing developments reflect the Supply Corps research program, or at least one aspect of it. One example of this is the immersion suit, designed to protect aviators from exposure if forced to ditch their aircraft in cold waters.

The pivot point of fleet mobility is lubricated by an efficient replenishment at sea program. During underway replenishment the ships are vulnerable to enemy action, therefore supplies have to be transferred and stowed quickly, using minimum manpower to accomplish this. Here, again, research is helping us. New methods and equipment are being introduced into the supply system by the Naval Supply and Development Facility at Bayonne, N.J. which will help us immeasurably to support fleet mobility.

Development of materials handling equipment is only one of the phases aimed at sustaining the combat ship. Another phase is devoted to cutting down the time taken between requisition and issuance. Wherever practicable our depots and centers are installing electronic data processing machines, simplifying forms in general and becoming more responsive to requests coming in from the ships. We are getting faster service with less

Mediterranean replenishment operations in action involving carrier USS *Forrestal*.

BEFORE—The long white line bucket brigade method of materials handling aboard ship.



AFTER—Testing similar movement with less manpower using skate wheel conveyors.

paperwork now.

Much of our efforts are not only directed at efficiency in logistic support, but also at economy along the entire supply network. As in any business or industry, our entire operation must be accounted for. There must be an honest dollar value when we buy or render a service. Our supply system enables us to determine what is necessary and what isn't. It is a system which protects us from wasting money on equipment and supplies which could become valueless.

Our supply network has proved effective, due in large part to the men and women in the Bureau of Supplies and Accounts, as well as in the field activities, who administer and operate our program. These dedicated, well-trained personnel—both civilian and military—are not afraid of change or reluctant to try new ideas which will help us fulfill our obligation of "service to the fleet."

The service we provide should be as predictable and dependable as the tide. By supporting each ship to the fullest extent, the Navy can sustain its effective force whether it be a major effort like the Korean conflict or a standby operation such as the Suez crisis. In many instances our fleets have operated at sea for long periods of time, sustained by our mobile logistic support.

Our present supply system is sound, but there are still many areas in which we are working to make it better. Some of the ways we are doing this are by:

(1) Developing and installing methods for obtaining complete supply usage information, as material is used, and putting data into usable form at Inventory Control Points for determining future consumption.

(2) Bringing shipboard supply allowances into balance by working with the Chief of Naval Operations and technical bureaus to analyze supply usage.

(3) Simplifying and speeding up issue of supplies.

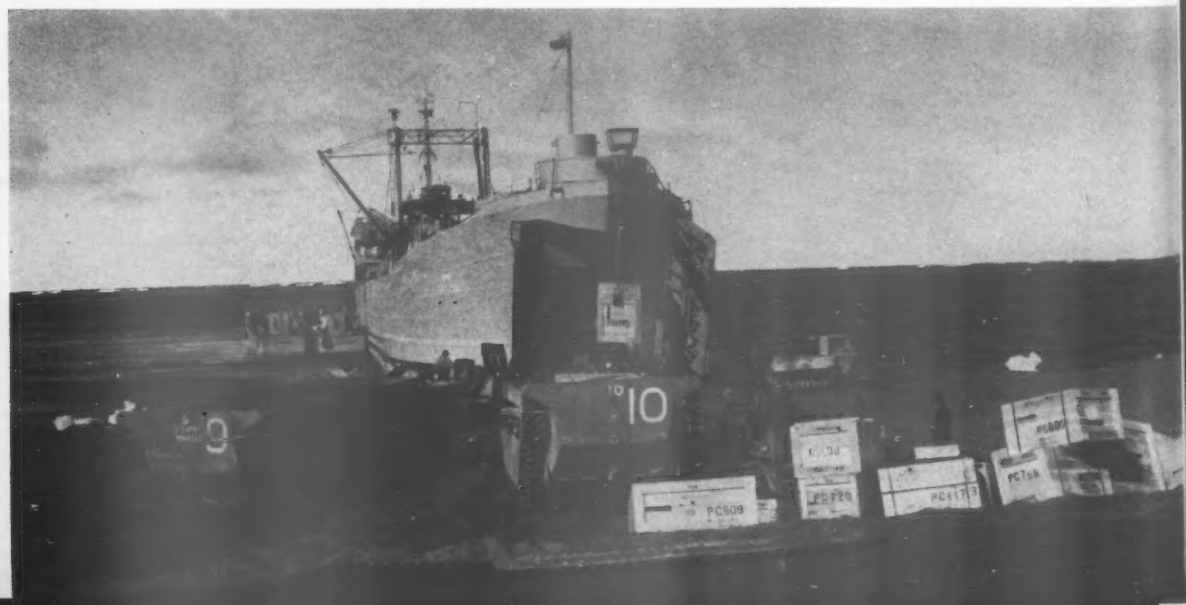
(4) Finding more accurate ways to compute and apply readiness and cost factors in calculating stock levels, procurement schedules, the distribution of stocks and the disposal of unneeded supplies.

(5) Improving the measurement and control techniques used in the operation of our supply organization to assure good business management.

(6) Using the best techniques possible for automatic data processing and rapid data transmission.

These six points represent a direction for our future planning, and the outcome will shape and influence our functions. As the fleet moves and as the ships change, so will the supply system. Our adaptation to the changing technology will help us perform any logistic task set before us in the years to come.

An LST demonstrates unloading speed, cargo being removed both through opened front doors and out of the hold into another landing craft.



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The new TK-201 Equipment consists of compact camera (above) and modular-type control unit (not shown).

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Because of the missile, the Air Force has had to reevaluate its entire logistics structure. It is a new twist to an old idea called

Logistics Readiness

by Lt. Gen. C. S. Irvine
Deputy Chief of Staff, Materiel
Headquarters, USAF

IN recent months, the term "READINESS" has been applied to such things as concept, condition, posture, and principle. The application is probably true in each instance. When it is appended to a primary military function, however, it becomes a state of *motion* rather than a state of being.

For true readiness in any military sense is continually progressive. During each hour, each day, things move in preparation for the next. Nothing is really static. The idea that military readiness implies a stockpile of people and hardware based and stored at dispersed locations *but relatively inactive* is one that should be dispelled as quickly as possible.

This is especially true of logistics, the military function that, in effect, bridges the gap between production and operation. Manufacturing plants may operate at peak production levels, turning out quantities of hardware and equipment which strategic, tactical, and air defense units need. But unless the complicated machinery of putting the right things in the right place at the right time is well oiled, the defense network is inefficient.

In order to understand the real meaning of "logistics readiness" then, it is first necessary to consider the other two military functions which must be connected: the operating forces on one end, and the industrial complex at the other.

Operating Forces

The operating forces of the United States Air Force must possess the continuing ability to react *immediately* to any degree of aggression. They must also possess in sufficient quantities the most effective and most reliable weapon systems and support equipment that can be supplied to them. Further, maintenance people must have on hand whatever it takes to keep these systems and equipment in peak operational readiness.

Today, the needs of the operating units are very complex. In the foreseeable future they will become even more so. For in the years ahead, the most desirable inventory of Air Force weapon systems will consist of a variety of manned and unmanned air vehicles.

This is made necessary because each weapon system has certain advantages and disadvantages. No one weapon system is ideal for all missions and under every circumstance. This is certainly true of present day aircraft, where there is no universal system which can serve effectively as a fighter, a bomber, a transport, and a trainer. A single all-purpose missile system cannot be expected, either.

There will be a requirement not only for many types of weapon systems, but also for an increasing variety of ground handling, ground support, and communications equipment. The trend toward greater capabilities of such equipment, and the resulting increase in complexity, means that the logistics function is becoming more difficult with the introduction into first line inventory of any of these.

Industrial Forces

At the other end of the defense chain, the industrial forces of the United States are doing their best to maintain whatever degree of technological superiority now possessed, to catch up in those areas in which we appear to be behind, and to push toward even higher performing air and air/space vehicles. Generally speaking, they are making headway. In so doing, however, they are turning out completed systems and essential spares in numbers and kinds that tax the imagination of any individual or group of individuals to try to comprehend the scope of the total production effort.

In face of the probability that if this country is attacked our production machinery may be severely crippled, industrial readiness has taken on a new perspective. Each finished item coming off the assembly line is theoretically considered the last one available to the operating forces. We cannot afford to rely on any degree of post D-Day build-up and accelerated production. Since the general philosophy of "win or lose with what we have on hand at the outbreak of hostilities" is the only one that can be lived with, it is incumbent on the industrial complex to assure continuous availability of the most effective hardware.

Also, in connection with the production end of military business, because of the high unit cost of weapon systems, support equipment, and individual components, the Air Force cannot afford to buy excessive quantities and stockpile them either at the source of manufacture or at a depot. This is especially true when you consider how rapidly new items become obsolete.

By limiting the quantity of items produced, however, an extra burden is placed on the link between maker and user. Items must be moved to the operational units with the least possible delay so that the hardware that is produced actually enhances our defense strength. Critical items can be neither stored indefinitely nor left in the pipeline for an excessive period of time.

Logistics Forces

To bridge the gap between the operational and industrial forces with maximum speed and accuracy, the logistics function must act rapidly. As a matter of fact, it has been necessary to evaluate the entire logistics framework for suitability and adaptability to meet the requirement of the air and air/space era.

One primary cause for such re-evaluation is the missile. It is unlike the manned aircraft in many respects, insofar as logistics is concerned. It must be absolutely and completely reliable when called upon to function. In a manned aircraft the experienced crew is on hand to correct or compensate for malfunctions which may occur after taking off on a mission. For the same reason a manned aircraft can often be dispatched on a mission and be expected to accomplish it even though something may be lacking in its combat configuration.

This is not true of the missile. Once an IRBM or an ICBM is launched, it cannot be recalled. It will be completely wasted if it cannot complete its programmed mission.

The one-flight nature of the missile also has some other ramifications. Unlike the manned aircraft, each individual missile cannot be flight tested and is not subject to extended usage. The only data on actual performance which can be obtained must come through elaborate instrumentation of test firings. Since the missile flight is of extremely short duration, there is little time for test data acquisition.

The mission profile of the ballistic missile introduces new environmental conditions and difficulties. For example, major scientific and engineering effort has been devoted to the problems created when the missile re-enters the earth's atmosphere. The speed at which the nose cone is travelling at that point would cause it to burn up if special measures such as "blunt nose" shapes, heat dissipation designs, and heat resistant materials were not resorted to.

Provision had to be made to carry an oxidizer to enable the fuel to burn outside the atmosphere. Many handling and storage difficulties result from the need for liquid oxygen, the most commonly used oxidizer. The influence of weather on operations also changes with respect to a missile. Visibility requirements for manned takeoff, mission accomplishment and safe landing are obviously no longer factors to be considered.

In the case of missiles a very large proportion of ground-based equipment contributes directly to the success or failure of the takeoff or launching operation. Compression of the development-production cycle of the weapon magnifies the problem of designing the related specialized test and ground handling equipment and makes it extremely difficult to achieve concurrent delivery of all weapon systems hardware.

As a result major supply problems will be generated as the new weapons are introduced into the operational inventory. Necessary steps must be taken, in advance, to insure that supply deficiencies will not become limiting factors on weapon system capability. Management attention is being concentrated on these potentially troublesome areas which would reduce the alert status of a weapon.

The inability and obvious lack of need for a missile to stage through bases on a mission or to land at alternate fields in the event of bad weather, as in the case of manned aircraft, alters existing base stockage policies and requirements considerably.

On the other hand, when strategic dispersal of launching pads is considered, the total requirement for missile support equipment may not be

At Castle Air Force Base, Calif., KC-135 jet-tankers (here backed up to sound baffle), built to refuel SAC bombers in operational flight, have stepped up strike-force efficiency.

appreciably different than for manned aircraft. What is important is that the proper policies be developed and applied to insure the validity of supply requirement computations.

Missile launch complexes may or may not be added to existing Air Force installations. In some cases the nature of the missile, plans for its employment, or strategic dispersal considerations may dictate an entirely new site. Other missile units may be located in close proximity to existing Air Bases to facilitate aerial resupply, and some may conceivably be integrated into present base complexes. Additional construction will undoubtedly be required in each case and continuing review of the relative usefulness and adaptability of Air Force installations is essential.

Test loading is conducted on Army's Honest John missile and trailer at Eglin Air Force Base to see if Lockheed C-130 can handle it.

The fabrication and maintenance implications of the new weapon systems are especially significant. Far higher standards of reliability and finer tolerances will be required than ever before.

The basic "in-house" maintenance capability policies of the services must be reviewed to insure that the most advantageous arrangement between the manufacturer and the user is established. It may be that "go-no-go" checkout of major components of a missile will be performed and whole defective assemblies unplugged and replaced with new ones. The defective components could then be returned to either the manufacturer or a specialized maintenance activity for repair.

In achieving this type of equipment checkout, however, it will be necessary to design, develop, and utilize extremely complex and highly specialized test equipment which itself must be maintained in top condition. The effects of prolonged periods of alert, test run-up and checkout, and standby storage and handling of missiles in actual operational inventory are not fully known because of insufficient experience with such problems. There will undoubtedly be some deterioration of items "on-the-shelf" and some wear-out from static firings and similar testing. We do not yet know how these factors will compare with our experience on manned aircraft usage.

The Air Force has been continuously engaged in refining and improving its logistics system to keep pace with changing strategy and technological advances. The forced introduction of radical new weapons into the operational inventory makes a speed-up in revising some phases of military logistics mandatory. The RAND Corporation is conducting a series of logistics research studies to determine optimum support policies and procedural patterns. The results of their studies are being applied to the Air Force maintenance and supply activities.

Already a Weapon System Supply Manager arrangement has been adopted by the Air Materiel Command to facilitate supply support of operational units. Through the use of a world-wide Transceiver communications network, processing time for supply transactions has been reduced significantly. Electronic data processing equipment is providing vital management data faster and more comprehensively than before, thereby improving materiel programming and management control. The technical skills of the manufacturers are being extensively utilized in a virtual "partnership" arrangement with the Air Force maintenance organization. The Air Materiel Command depot structure is already in the process of being streamlined for increased efficiency.

The Strategic Air Command's "Readiness" concept is well known and has become justly famous. The reflex action now required of the supporting organization extends the SAC readiness concept to logistics. New thinking, technology and methodology are essential if logistics reflex action is to become a reality.

The USAF Materiel activity has such a logistics program now. It is being steadily improved to meet any demands placed on it by the operating forces. *Logistics readiness* within the Air Force is today an effective complement to the readiness of SAC. *It has to be.*

Irvine Warns Industry

Lt. General C. S. Irvine, speaking at a Jet Age Conference in Washington, D. C., told manufacturers they must move toward better methods, tooling, and techniques at a far greater rate than they have in the past.

"Those that cannot keep pace cannot expect much in the way of Air Force business."

Speaking on the subject of missile production, Irvine said if space vehicles are to become a reality "companies have got to stop thinking up ways to stay in the old fashioned 'horse-and-buggy' habit of long production runs."

"The rate of obsolescence is accelerating. The day is long gone when we will produce thousands of similar systems over a period of four or five years.

"Development and manufacture of both manned and unmanned air/space vehicles will call for a vastly improved contract structure (and) contracts probably will be spread over a much wider base than is the case at present."

"In recent years the weapon system concept has become the management tool through which we have streamlined our development and production actions." He urged industry to find *and use* similar improved administrative, engineering and production techniques and said new ideas, methods and attitudes are absolutely necessary.

Government Personnel Mismanagement

If you have had trouble with "management engineering experts," you'll appreciate this actual case of what can happen when common sense goes out the window.

by T. E. Slew

IN MY activity I need two new men, need them badly to do the work that must be done. The organization is such that expansion is within the realms of reason and based on the adage that with responsibility goes a corresponding amount of authority, I set in motion the wheels of personnel procedure that grew from a meek request to the significance of a major undertaking that was to reach the attention of a three-star general.

Through a government form, Request for Personnel Action, I asked that two people be assigned to accomplish the tasks. After a few days a flood of questionnaires and forms flowed into the office with instructions for filling them out. (All work came to a cease, resulting in a feeling of elation from the fact that now our backlog of work was building up rapidly.) "Why did the work require additional help?" "Why hadn't work simplification been used?" "If so, why did it fail?" "Why couldn't duties be shifted for personnel to work more efficiently in other areas?" "Why was the current workload increased?", and, in general, "Why did you think you could get needed personnel without first the OK of the Personnel Management staff office?" Soon the secretaries were the most sought after individuals of the organization, to type nine copies of the required questionnaire.

Three weeks later, and to my surprise, in walk two men. How fortunate can a division be to get good men so quickly, thinking that these were assigned to me! I should have recognized that impossibility for these men were dressed in gray flannel suits, but this I did not notice until they began to indiscriminately use the lingo of "management engineering," "work measurement," "program analysis," "functional organization," and similarly high semantical words for getting a job done. I then realized: To determine my needs (and I had already determined that), a manpower survey was about to take place.

In only three weeks, every member of the staff was intreviewed by these men, carefully going into the details of operations, responsibilities, activities, why workers were needed, why the workload had been increased, and the multitudinous information that had already been supplied them in the questionnaire. The precision of the survey team was a marvel to watch: Arrive sharp at 9:00, coffee break at 10:00, leave for central office 11:30—Return 1:30, coffee break 2:30, return to the central office 4:00, and in a work period, each individual must have sketched at least three dogs, two trees and an excellent picture of himself or his boss, plus rephrasing a few sentences from a previous questionnaire.

With a sigh of relief, and in anticipation of the needed personnel, the office gradually returned to normal—a few desk tops had to be repaired where cigarettes had been mislaid, records hunted which were found in files bearing no relation to the subject matter (all of which had been filed purely unintentionally), and the general restoring of pens, pencils and office equipment that had been taken for exhibit purposes.

Then came the answer in a staff study—1½ pounds. This was the second rephrasing of material originally submitted in the questionnaire. However, there was a conclusion. "Your activity has been throughly studied and all doubtful areas have been discussed with higher echelon, and we have found many areas of excellent management and measurements, and it is felt that an increase in personnel is justified, especially in the administrative areas. The measurement of work performed indicates a distinct overloading. Therefore, your projected workload shows the need for two people for your office services section. Because your technical personnel were unable to establish definite work measurements and performance and since it is largely development of ideas and practical application, we cannot recommend additional personnel in this area, and besides, army manpower has adopted the policy to cut all non-administrative sections."

With this, I blow my top. To the general I go. He, being well aware of the work load and his responsibility to see the job is done, overrides the management experts and grants the increase of two technical people, and away I go, knowing that finally I am going to get my needed people. The Personnel office will now go out to hire them.

But alas, I'm betrayed again. First, a job must be established and the gray flannel suit boys are again with me and for a fourth time, the why's and how's are asked of each echelon of supervisors, with the salary analyst hoping someone will make a statement in contradiction to some earlier remark where they can again start the process over. Then the writing of the job description. From the terminology of the work expected from the proposed employee, the next thing I read is a piece of descriptive literature of which W. Shakespeare, Zane Grey, or Agatha Christie would be proud. The rhetoric exceeds that of William Jennings Bryan, Franklin D. Roosevelt or Winston Churchill. That description just couldn't be the job I'm needing done. But since apparently the analyst is happy, I eagerly sign the form and think now I have a description that will justify a grade that will pay enough to attract good men.

But no: I'd forgotten the classifier who will review the description against so-called national standard to determine the grade or rate of pay. Because he is trained and equipped to withstand such glorious descriptive adjectives, the job is immediately rated two grades below that planned. Classifier's attitude: "Our job is to see that Civil Service regulations are abided by, not to assist you in getting work accomplished."

The job is established (two grades low), now Personnel has the authority to recruit. A letter to the regional Civil Service Commission for a register of eligibles—back it comes, man lives in Timbuctoo, won't move for grade offered. "How about recruitment?" No examination open to take, it has been closed two years, and probably won't open for another two years.

Here I sit—no additional help—time lost to my organization, 75 man days, not including time of gray flannel boys and staff experts, which was probably ten-fold my expenditure. I'm going home to wrap the draperies around me and lie down to horrible dreams of the work yet to be done!

Washington Background

A COMPLETE REVERSAL is in the wind on Defense Secretary McElroy's decision to make both the Air Force Thor and the Army Jupiter in quantity. Reason: it runs contrary to several logical, overriding facts. Among them:

1—One of the basic ideas in managing research and development projects is that the Defense Department builds into them a competitive effort. In the Thor-Jupiter case, vital necessity of having an IRBM quickly meant Jupiter was insurance against losing any time if Thor fizzled. But, basic to the entire system is the rule that duplication stops when the R&D problem is solved. The big money will be spent in operational production and there duplication is pointless.

2—Scientific experts pretty much agree that the Army-Air Force race ended in a virtual tie. Personnel training, supply and support problems will be needlessly complicated if both projects are kept alive.

3—The days of the liquid propellant missile, except for space flight, are numbered. Navy's spectacular success with the solid propellant Polaris is making it a much more appealing military weapon for all three services—it's safer, easier to handle, more rugged.

4—Douglas Aircraft Co., builder of the Thor, claims once it starts it can build more than enough Thors a month to satisfy present military plans for an IRBM's use.

WHERE THE ADVANCED RESEARCH PROJECTS AGENCY, Secretary McElroy's first major effort in Pentagon management, will fit in the Defense Department organization may be a clue to things to come. He now has a director for guided missiles, and special offices for advanced research and atomic energy, each of them small, tightly knit groups with a good deal of authority and influence. This leaves the Assistant Secretary of Defense for Research and Engineering with by far the largest staff (over 240 people) and, apparently, the least amount of responsibility.

WHATEVER the Pentagon suggests in the way of reorganization, it is likely to have tough sledding in Congress which is rapidly forming several disjointed ideas of its own on what should be done. Proposed legislation ranges all the way from merely altering the JCS setup to abolishing the three service secretaries and having the military branches report directly to the Secretary of Defense. Whatever the outcome, there are two reasons the battle had better be fought on something higher than a political plane:

1—Even in small private businesses, just talking about reorganization causes havoc in the existing operation. Basic to any organization change is the need for carefully defined answers to specifically stated problems. Generalized answers for generalized problems result only in more confusion.

2—The present organization, whether good or bad, has built up a large momentum, through both official and unofficial channels, for getting things done. Any major reorganization, no matter how good, is going to destroy that momentum and it will have to be built up again. Whatever that lapse may be, can the U.S. afford it in the race with Russia?

Adding all this up leads some Washington observers to believe that the Pentagon suggestions are going to be something less than a major shakeup and more like a sanding down of bureaucratic rough spots.

OVERLOOKED in the headlines on the Army Explorer's success has been the fact that it is a potent argument for those who contend that interservice rivalry has been largely over-played except at the top military level. The designers and members of the working teams function very well together. One example: the first stage rocket was originally developed for the Air Force by North American Aviation and AF later had it modified at Army's request.

NOT MENTIONED in the scramble to produce more and better missiles, has been the burgeoning headache of the supply people in providing proper support. Services right now are banking on Electronic Data Processing to bail them out, but experts say they are about two years away from being sure and there are a great many unsolved problems. (See story below).

EDP Market May Break Wide Open

The computer market, up until now has been virtually a closed operation for one or two companies. There are indications that by 1960 this market may be up for grabs.

For instance, the Air Force, far and away the best customer for EDP in the world, has budgeted $21 million in 1958 for computers, etc., another $29 million in 1959; may run this up in excess of $35 million by the early 1960's for logistics operations alone. But the Air Force has some unsolved problems.

They admit they are in the midst of a five-year learning cycle, due to wind up in 1960. By then, they hope to have solved several problems; training personnel, establishing a single "best" system for use of the equipment, defining the requirement for EDP and computers (which no one has done yet).

Reason the market may break wide open: Leading present suppliers have been "something less than enthusiastic," said one official, when the Air Force has asked their help. Specifically, the Air Force is having little luck on, among other things, getting industry to standardize on an "alphabet," i.e., classification and character structure. (Closest analogy—many firms make typewriters which are different, but they all use the same type of keyboard). Another problem: high prices. computers can add, subtract, multiply and divide. For the bulk of their work the logistics people, for instance, need only the add and subtract capability. In other words, they have to pay high prices for equipment whose full potential they cannot use, like having to buy a Cadillac when all you want is transportation to work. One other headache: there is no standard in business for setting up the flow charts. Consequently, one man, supposedly checked out on computer equipment, often can't read another's work or understand what he has done.

Net result of all this: if they can't get satisfactory answers from the leading suppliers, the Services will draw up specifications.

In the supply field, the outcome of this hassle could have far-reaching effects on military logistics. For instance, EDP could make possible an immediate, almost daily check on inventory and procurement trends (and an end to stories about buying a 10-year supply of hamburger); an automatic communications network worldwide to quickly fill supply needs (about 80% of the time now spent filling installation requests goes for passing the information back and forth).

Army Logistics Planning For the Future

by Lt. Gen. Carter B. Magruder
Deputy Chief of Staff for Logistics
Department of the Army

Based on information supplied by *The Army Information Digest.*

THE scientific advances of this atomic age have given to our armies new explosives of tremendous power and the ability to deliver them with accuracy at ranges far beyond previous capabilities. The ascendancy of the offensive over the defensive, which was lost to the machinegun-barbed wire combination in World War I, is restored. Logistically, this means that the Army must be prepared to support its combat forces in movement more continuously and over greater distances than in World War II. At the same time the difficulties of providing logistic support to our combat troops will be increased.

In future wars, any major installation is liable to be destroyed at any time by a missile carrying an atomic warhead, any bottleneck in our lines of communication is liable to be rendered impassable at any time, and changes that atomics bring about in the tactics of our combat troops promise to put an end to the security of our lines of communication.

In any future atomic war the dispersion that we must accomplish habitually to avoid offering profitable targets to enemy atomics will prevent the formation of the strong continuous line that has protected our Communications Zone in the past.

Since we must always be prepared for the worst, I propose to review first the logistic problems and solutions for a general atomic war and then later discuss those logistic problems we may meet in a local war which may differ from those of a general war.

In General War

In any future general war, atomic attack on the industrial centers of the United States could be expected and, although we could inflict tremendous losses on attacking enemy aircraft and long-range missiles, a considerable amount of destruction of our industrial plant may result. Likewise, there may be a considerable loss of trained industrial personnel. Under these circumstances, we could not depend as completely on industry for the production of munitions as we have in the past years. This requires that, before an atomic war starts, we have a balanced stockpile of all types of military equipment in reserve, so that we can support the Active Army and some of the reserve components in action without early deliveries from industry.

Our reserves of equipment and supplies must be protected against loss. Depots are not in themselves worthwhile targets for atomic attack unless we make them too large or concentrate in a very few depots a great portion of our supplies of some critical type. Dispersion of our reserve supplies within the United States is therefore essential for protection.

Desirably, depots should be so constructed that they give protection against fallout. Each critical item of supply must be stocked in at least three or four different locations well away from major target areas liable to be attacked.

Our transportation system within the United States may be hit, but even transportation bottlenecks within the United States do not offer a remunerative target to the enemy. Experience in Europe in World War II indicated that breaks in the transportation lines could be repaired or by-passed so readily that a line of communications could be interrupted only if the line was cut time and again by repeated attacks. Accordingly, I do not believe the military services need make any special provision to maintain our transportation lines within continental United States against such attacks. The well qualified repair crews that now exist outside the military services should prove themselves able to cope with disaster.

Our ports, particularly our great ports such as New York, offer worthwhile atomic targets and could be severely damaged. However, we have many secondary ports, too many to be all knocked out. Our solution to the port problem is the establishment of Transportation Terminal Commands. These commands will decide what secondary ports will be used should major ports be damaged; they will call upon general depot complex commanders to ship supplies to selected undamaged secondary ports over selected undam-

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aged routes, so that cargo destined for overseas shipment can move from our depots to ports in spite of damage within the United States.

The safety of our shipping is a difficult problem for the Navy. Losses of ships and cargos may be expected, particularly in the early phases of another war, but even so we do not expect our sea lines of communication to be cut for any protracted period.

The great mass of our supplies will still move overseas by water. In peace, only about one percent of the tonnage crossing the Atlantic is carried by transport aircraft. What is economical in peace is an indication, at least, of what is practicable in war. I look to see the proportion of air to water lift increased considerably in time of war, perhaps up to five percent.

In our use of air transport we will be selective. We will seek to have air transport allotted to the Army for critically important strategic troop movements, and for critical personnel and supplies.

While the battle of the sea lanes is being fought, heavy cargo losses may be anticipated. It is therefore essential that before war starts we have on hand in overseas theaters a heavy reserve of combat essential supplies. Measures are being taken now to increase the level of our overseas reserves.

Continuing along our line of communications on the continent, we must expect continental ports to be damaged. Moreover, a large number of ships in any location offers a highly remunerative target. We must not permit such targets to be so formed.

Rather, we must disperse our shipping on arrival at continental destinations. We must have many locations where packets of four or five ships may be unloaded. Packets of ships which carry heavy lift cargo may well be unloaded at existing ports but with only one packet in the harbor at one time. Other packets will be unloaded over sheltered beaches with the use of lighters, landing craft, floating piers, overhead tramways, or any other available means.

During peacetime, we are preparing and training for these operations by performing them every few months in our overseas theaters. In these exercises the cargo is moved across the beaches to railroad trains and then to depots so that there is no accumulation of cargo that may offer the enemy a worthwhile target. The speed with which these ships are unloaded determines the capacity of any port or over-the-beach unloading location as well as the time during which our ships are most vulnerable to attack.

In the interest of speed in unloading, we are striving increasingly to handle cargo with mechanical equipment. Small items are being strapped on pallets or packed in standard Conex shipping containers to make easily handled loads. Roll-on roll-off ships are under development and should be available by 1962 to expedite unloading. Coupled with improvements already made, they should decrease the time in port to about one-fifth of the unloading time required in World War II.

Within the theater of operations a depot becomes a more remunerative target to the enemy than it is in the United States. It can be reached with weapons of less range and is therefore more liable to be attacked with atomics. This accents the importance of dispersal of stocks in an overseas theater by the establishment of general depots, each with a cross-section of all the supplies required by the combat troops. Before 1962 all overseas depots should be general depots.

There is an added requirement that ties in closely with the dispersion of stocks in general depots. Since we must be prepared to suffer losses of some depots by atomic attack, it becomes increasingly important to be able to determine at any time what stockages remain ready for issue. This problem is being met by the installation of electronic machines that are capable of recording inventories and of giving instantly the location of whatever stocks of any item remain available. Duplicate machines facilitate the establishment of such inventories at several places so that the loss of one stock control point will not affect over-all operations.

Base section depots will be located far enough from the ports and beaches to secure protection by dispersion but close enough to avoid overburdening the transportation system with long hauls of cargo not needed urgently by the troops.

Forward of the base section, supplies will be located in two areas—in an Advance Section, and in Field Army depots. Both will carry essentially the same stockage. When an army advances, its depot units will move forward to establish new depots and will leave behind, in their old installations to be taken over by the Advance Section, such stocks as are not mobile.

While the Field Army depots are moving, the Field Army depends upon direct supply from the Advance Section. When the Advance Section moves, the Field Army depends for supply on its own depots. To the maximum extent possible, light but complicated supplies (such as repair parts) stocked in the Field Army depots will be carried in vans so that their movement will be relatively easy. Ammunition and POL stocks are relatively immobile and will be left behind for the Advance Section to take over.

The movement of supplies from the Base Section to the Advance Section must be over transportation lines whose bottlenecks may be knocked out again and again. Enemy guided missiles fired with map data as formerly employed with long-range artillery can keep these bottlenecks broken almost continuously.

This means that we must be prepared to repair such bottlenecks rapidly, to detour them if they cannot be repaired and to construct such detours rapidly. We must have cross-country vehicles that can detour the bottlenecks after a minimum of construction and heavy-lift helicopters such as the flying crane that will permit us to bridge them. For critical cargo of relatively light weight we may use small cargo-type fixed-wing aircraft that are capable of landing in open fields, or at least on division airstrips. Air bases of the heavy construction now required make too inviting a target.

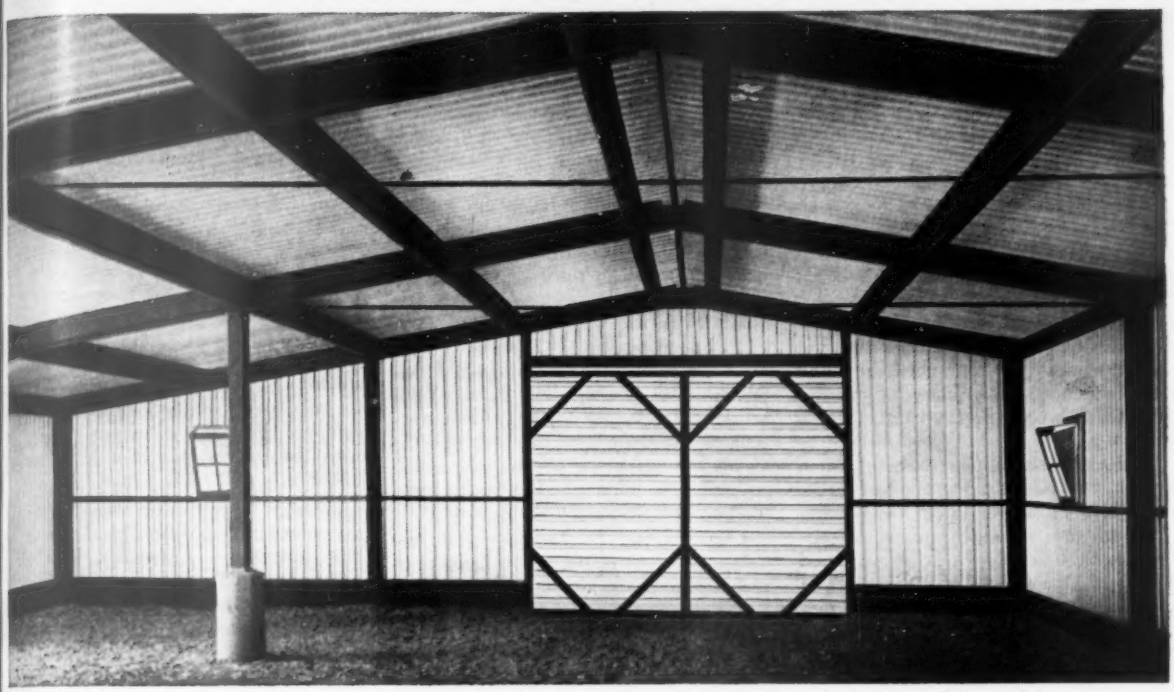
For the Field Army depots we have developed and are building small general depots, each of which will contain austere supply for an Army Corps. If one of these is destroyed, the Corps can draw from an adjacent Corps or from the Advance Section. It is essential that these depots be kept small else they become difficult to conceal and make inviting targets.

As we approach the front, the movement of supplies will become more and more difficult. At the same time the need for movement becomes greater since the power of atomics has restored the ability of ground forces to move.

The tactics which demand dispersion of combat units may well make impracticable the establishment of any type of strong continuous line, penetration of which requires the major effort of a large force. Such a line was found necessary in both World Wars and in Korea. Without such a line, small enemy units can infiltrate far into our rear areas, blow up railroads, mine roads, destroy convoys, attack installations.

Our base sections will require a protected perimeter. Forward of the base section every unit must be prepared to fight in self-protection. With portable guided missiles or with anti-aircraft automatic weapons, penetrating enemy units can bring down our low-flying cargo planes and helicopters, so we must expect to take losses.

Reliance will be placed on light cargo planes and helicopters for the movement of critical items and emergency supplies whenever required. But we must not assume that these valuable but expensive aircraft provide any



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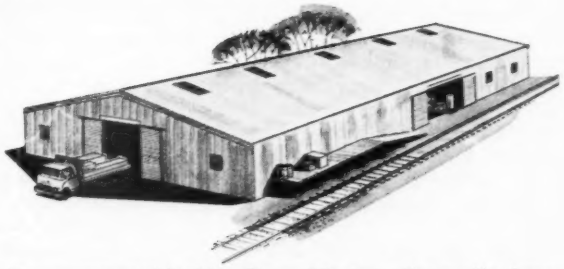

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basis for scattering combat units in isolated locations, with sole dependence being placed on aircraft for their routine supply.

Our overland supply convoys must be capable of cross-country movement and of fighting their way up to the units they are to supply. Combat troops in considerable numbers will be required to provide protection against large enemy units that have penetrated our rear areas; they must hunt down these units and destroy them. Armored personnel carriers and armored utility vehicles will be incorporated in our major units in great numbers and will offer assurance that our supplies can be fought through to the combat echelons.

Following an atomic exchange in a general atomic war, we are not going to be able to deliver to the troops supplies in the tonnages to which the United States Army was accustomed in World War II. Since World War II our mechanical and electronic equipment has increased. The new word "austerity" is coming into use and needs to be emphasized more and more.

In World War II we found that troops could fight for short periods when supplied with only ammunition, food and gasoline. Before 1962 I believe we will have cut our requirements for those three basic essentials as much as possible and added a minimum of other necessities so that tonnage of supplies required by our troops will be down within the realm of possible delivery. Following are some areas of possible reduction or addition:

Ammunition. Ammunition has always been our heaviest tonnage. With the minutest fraction of the weight of conventional ammunition, we can now get the same explosive effect with atomics. We will progress in making our atomic explosives smaller so that they can be fired closer to our own troops without endangering them. Very small yield atomics will replace much of the heavy tonnage of conventional ammunition.

Food. The Army has always had emergency rations of very small bulk but they have not been adequate to subsist men for many days. To feed troops properly, it has been necessary to deliver refrigerated meat—and refrigeration itself is a considerable tonnage item. Progress with irradiation of food indicates that by 1962 we will be able to dispose of refrigeration in forward areas in a combat theater. We will be able to provide irradiated and dehydrated foods which need only water and heat to provide a diet which is not only nutritionally good but comparable to fresh foods in taste. As a result, troops will be better fed; and we can make combat soldiers out of the cooks and kitchen police.

POL. By 1962 essentially all of the Army's heavy engines should be compression-ignition engines. These will offer the economy of the Diesel engine, yet will have the ability to utilize gasoline and heavier fuels, including captured enemy stocks. The installation of these engines, plus the general reduction that we must accomplish in tonnage of cargo to be moved, promise great reduction in the tonnage of POL that must be delivered into the forward areas.

Engineer Materials. Next in the list of heavy tonnages are engineer materials, with perhaps the heaviest requirement for items used in construction of airfields. Cow pastures and division air strips do not require much construction material. We must learn to operate from such airfields.

Class II and IV Supplies. The replacement of worn-out or damaged end-items is a major tonnage requirement. We must expect that equipment which breaks down in movement and is left behind in an unprotected rear area may be destroyed by enemy patrols; moreover, working parties endeavoring to salvage such equipment may well be attacked. Transportation difficulties are going to make it uneconomical for us to evacuate heavy equipment to the rear.

The ease with which major manufacturing facilities can be destroyed would render doubtful the desirability of maintaining rebuild shops in an overseas theater. Rebuild of equipment is a peace-time operation. In future war it will probably be confined to the most critical equipment—for tanks, perhaps yes; for general purpose vehicles, no. This means it is important that our equipment not break down, or if it does, that it can be readily repaired by semi-skilled mechanics in a relatively short time. We are devoting efforts to increasing the reliability of our equipment.

In his studies for the Department of Defense on possible methods of retaining qualified technicians in military service, Ralph J. Cordiner, President of General Electric, concluded that all possible steps should be taken to reduce the number of technicians that must be retained. He proposed that contracts be let with industry to make complicated equipment easier to operate and easier to maintain and thus reduce our requirements for technicians.

In addition to improving reliability and increasing the simplicity of our equipment, we must reduce and simplify our repair parts supply. We are attacking this problem by selective stockage in forward depots of only fast-moving, critically needed repair parts. Cannibalization by our Reclamation and Classification Units will provide any other parts that may be required. This will permit a reduction of repair parts in forward echelons to about 20 percent of those formerly carried.

In Limited War

Up to this point I have discussed only one aspect of logistics—the supply line for general war only—to make the discussion of the supply line complete and not because I consider general war a probability. Quite the contrary. With a general war being essentially suicidal for both sides, it is important to be capable of fighting such a war in order to have a deterrent effect, not with the expectation that if it occurs either side will really win.

Limited wars, on the other hand, are far more probable and promise to be less destructive. In such a war, it is highly probable that both sides will endeavor to confine active operations to local areas. It is rather difficult to estimate what limitations, other than territorial, may be accepted by both sides.

Whether or not atomics will be limited is difficult to forecast. As more and more atomic munitions are manufactured, atomics begin to approach the conventional. Nevertheless, the decision to use or refrain from using them will be a major political decision. It is desirable for our forces to be able to fight with or without atomics.

Virtually every allied country threatened with local aggression has armed forces of its own. The United States has equipped these forces, assisted in their training, and can expect them to give reasonably good accounts of themselves, provided they are assured that the United States will come rapidly to their assistance. No mere political assurance is adequate. The provision of adequate logistic support to these indigenous forces, together with the early arrival of American troops, become the critical factors in any local war. These are both critical logistical problems.

Since our airlift will be fully occupied moving American forces to the threatened area, the logistical support of indigenous forces must be provided for *in advance* by reserves positioned in the country threatened—reserves sufficient to last until additional supplies can be delivered by sea from the United States.

Availability of reserves in threatened countries depends in turn on the willingness of the United States to appropriate necessary foreign aid funds. I do not believe that great stockpiles of American equipment need be provided for this purpose at some American con-

trolled base overseas. Equipment stockpiles which are not drawn on continuously tend to become obsolete. Maintenance of such reserves in our overseas bases is an expensive proposition.

Accumulation of shipping at overseas bases is a much slower process than it would be in the United States. Loading is far more susceptible to delay by active interference. I hope that soon all the allied nations will have their own forces well armed and provided with reserves adequate to last until emergency resupply can arrive by sea from the United States.

Movement of American troops requires a different solution. For the first few days after the outbreak of local war, we can depend on local reserves for the supply of items common to both the local and United States forces, particularly for such heavy tonnage items as artillery ammunition and POL.

We cannot afford to stockpile reserves of items peculiar to the American forces in all threatened countries. We therefore face the necessity of selecting critical areas where we should stockpile an austere list of critical supplies of types not furnished to the local armies—supplies sufficient to support whatever forces we propose to airlift into a threatened area—with the expectation of moving these supplies rapidly by air or water and delivering them concurrently with the arrival of troops from the United States.

The major logistical requirement peculiar to a local war, other than speed of reaction, is assurance that expenditures of supplies and equipment will not be permitted to reduce our readiness for general war. To provide this assurance, we will maintain a standby industrial production base which, together with whatever industry is in current operation, will produce at the rate estimated for a local war.

Logistics has become far too complicated a function to be executed by amateurs hastily assembled into provisional organizations. Careers of our officers in the logistics field must be so managed that they acquire the background and understanding that is necessary to handle the tremendous tasks which will face them when changes in weapons, strategy and tactics require changes in logistics.

We must man our small communications zones and the Advance and Base Sections of our large Communications Zone with numbered logistical commands. Their personnel must work together and train together overseas and in the United States, just as the personnel of a division work and train together in peace as well as in war.

It is not necessary to throw away all we have learned about the tactics and techniques of logistics in prior wars merely because we can cause larger explosions to take place at greater distances, any more than it has been necessary to throw away the Field Service Regulations that guide the operations of our larger combat units. It is necessary, of course, to make appropriate modifications to increase dispersion, to guard against fallout, to expedite the delivery of critical items, and to organize areas for damage control, repair of atomic destruction and protection against infiltration.

A unit well trained and experienced in logistic fundamentals should be readily prepared to meet the expected in atomic war and improvise and modify its operations to whatever extent is necessary to meet unforeseen developments.

In summary, then, my conception of logistics in the atomic era is that in spite of increases in mechanical and electronic equipment, we can and must be able to establish a major downward trend in the tonnage requirements of our troops. We will accomplish this by scientific improvements of our equipment for greater reliability, by simplification of our equipment for ease of maintenance, and by austerity. Combat troops will operate at a level of austerity that they have heretofore experienced only immediately after landings on a hostile shore.

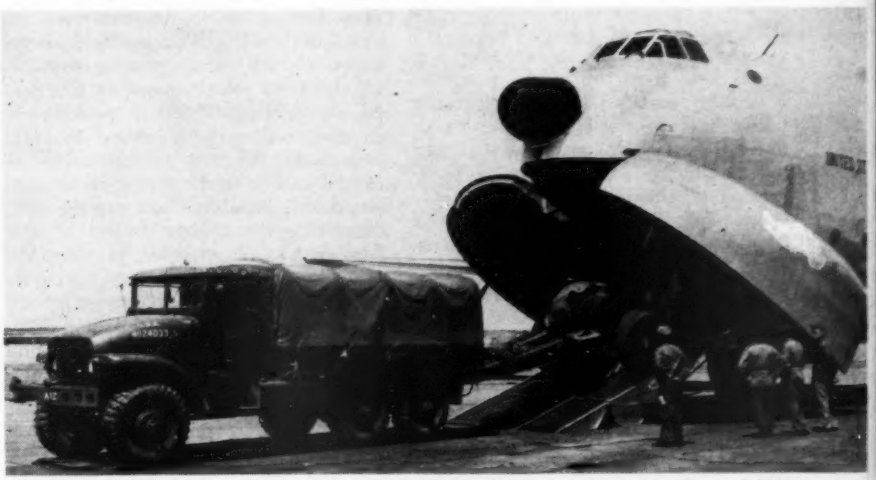
We will be able to provide from reserves, already manufactured, the requirements of our troops in the critical early phases of a general war, in spite of whatever disruption of our industrial production base may take place. We will have large reserves stocked in dispersed and protected locations in theaters of probable combat so that we will be able to support our troops overseas until deliveries can be made from the United States. In spite of difficulties and losses, we will be able to move troops strategically and deliver personnel and supplies to combat theaters.

To deter or resist local aggression, we will have Army forces in continental United States ready for immediate movement. We will be able to move personnel and limited amounts of equipment rapidly by air. We will be able to deliver heavy equipment and supplies rapidly to them from overseas stockpiles already established. We will be able to replace promptly whatever munitions they expend so as to maintain our readiness for general war.

Within combat theaters, support and service units will be prepared to defend their own installations. Supply movements will require protection, especially in the forward areas. A considerable commitment of combat troops to the protection of the lines of communication will be essential.

To accomplish all this, we will not need to "throw away the book" and develop a whole new system of logistics. We will develop professional logisticians who can modify what has been developed through years of experience to include the necessary provisions for larger explosions. We will have major logistical organizations that have served as units in time of peace so that they can maintain their cohesion under enemy attack and have the flexibility to initiate changes when unforeseen developments occur.

Joined in concerted effort, these men and these organizations will continue to support our combat troops regardless of danger or destruction in any warfare of the future—limited or general, atomic or non-atomic.



Joint Supply Effort—A 155mm howitzer rolls down the ramp of an Air Force C-124.

Plan Research Test for SAGE

Two 65-foot towers housing powerful radar equipment capable of detecting approaching enemy aircraft at long range have been put into service at the **Burroughs Corp.** Research Center in Paoli, Pa.

A joint statement issued by the **U.S. Air Force** and Burroughs said the radars will be used primarily to carry on simulated field tests of equipment developed and built for the Air Force SAGE System for continental defense.

Dr. Irven Travis, Burroughs vice president and director of the Research Center, said the radars will be used to test a coordinate data transmitting device known as "AN/FST-2." The equipment receives information in signal form from the radars, processes it in split seconds into digital form for transmission over telephone lines to Air Force direction centers where it is used to guide fighter squadrons in the interception of enemy aircraft.

Lt. Col. Joseph R. Waterman, of the **Air Force Cambridge Research Center,** said the radars will "play an important role in proving the reliability of equipment."

"They will make it possible," he said, "to subject working models to extensive testing under simulated field conditions, making certain that when the units leave the production line they will be ready for fast installation at defense sites around the country."

Radar units being used by Burroughs Corp. engineers to test USAF SAGE system.

New X-ray Technique For Solid Propellants

A new technique for X-ray inspection of solid rocket and missile fuel charges, which surpasses efficiency of existing methods, has been announced by **High Voltage Engineering Corp.,** makers of Van de Graaff particle accelerators. One of these supervoltage X-ray generators is the heart of the system developed jointly by **High Voltage, Thiokol Chemical Corp.** and the **Friez Instrument Div. of Bendix Aviation Corp.**

Inspection of solid propellants, heretofore a costly cumbersome process, is necessary to detect flaws in the propellant castings—hidden pockets or cavities can result in uneven burning, conceivably affecting the forward thrust of the missile and altering its course, or possibly burning a hole out the side, destroying the missile itself.

High loss of intensity, in old technique, resulted from X-rays having to pass through entire thickness of the missile before exposing the film. New method consists essentially of rotating and raising the fuel charge, spiral fashion, about the X-ray source. The charge is raised a few inches during each revolution. Thus, the fixed X-ray source, monitored on a Lumicon receiver outside the missile, provides a continuous radiographic picture covering the entire volume of the fuel charge.

Flight Center Opened

Lockheed Aircraft Corp. opened a new $9 million **Engineering Flight Center** in mid-February.

A five-acre complex of laboratories, precision workshops, hangars and offices, the facility will house 1200 scientists, engineers, technicians and supporting workers. Current programs include high-flying radar station aircraft for the military and P2V Neptune antisubmarine aircraft.

Missile Reliability

Materials engineering and testing techniques are the key to missile reliability, **William Holaday,** Pentagon director for guided missiles, said recently.

To attain this reliability, Holaday said, there must be test methods to evaluate known materials in newer environments. He cited the need to standardize present measurement methods, extending understanding of specifications to the many contractors in the missile field.

"The attainment of reliability," he stated, "is an engineering problem which requires elaborate information of materials and a thoroughly coordinated engineering effort to produce a proper design." Future missiles, he added, will employ high-strength composite materials, capable of withstanding temperatures which will "evaporate" any known material.

Science Forcing Change

Scientific developments are forcing a profound change in industry's attitude toward research and product development, said **Earl D. Johnson, General Dynamics Corp.** vice president recently.

"The great advances of science are of such a basic and far-reaching nature that business attitude must be adjusted to them. Executives planning corporate growth must use a perspective that is global, adjusted to the academic-scientific viewpoint, and shockproofed to new discoveries that result in product obsolescence on a broad front."

Jet Test Cell To Navy

A new Kittell Lacy Co. Jet Engine Test Cell is in the final stages of construction and installation at the **Whidbey Island Naval Air Station,** Oak Harbor, Washington.

The jet engine test cell is designed to test the latest in jet engines and is equipped to handle up to 30,000 pounds thrust. Test cell run-ins are required after work is completed on various sections of an engine to permit final adjustments before the engine is installed in an aircraft.

New Sales Tool?

Two years of independent research by the **Radio Corporation of America** on a **Ballistic Missile Early Warning System** may well have been one of the deciding factors in its picking up a multi-million-dollar plum recently.

Certainly the experience will prove invaluable in RCA's role as prime contractor for an **Air Force early warning system.** Contract covers design, development and building of a radar network to provide early warning of any

missile attack on this continent.

Experience and "our concept of systems project management, where we administer an entire project from start to finish, will stand us in good stead here," said **Arthur L. Malcarney,** executive vice president, RCA Defense Electronic Products. The warning system will be installed at top secret locations where long-range radar will seek out and pinpoint any ballistic missile firings with hostile intent.

Automatic Launcher Under Test

The first automatic missile loading and launching equipment for firing a series of ground-to-air defense missiles of the Talos type has been completed by **American Machine & Foundry Co.** The launcher is an integral part of the fully automatic **Talos Defense Unit** which has been developed for the Department of Defense by RCA.

Designed and built under subcontract from RCA, the prototype automatic loading and launching equipment and associated missile handling equipment is undergoing Army tests at White Sands Proving Ground, New Mexico. Pending the results of these tests and final contract negotiations, pilot production of the launching equipment would take place in a 200,000-square-foot government plant near Rochester, New York.

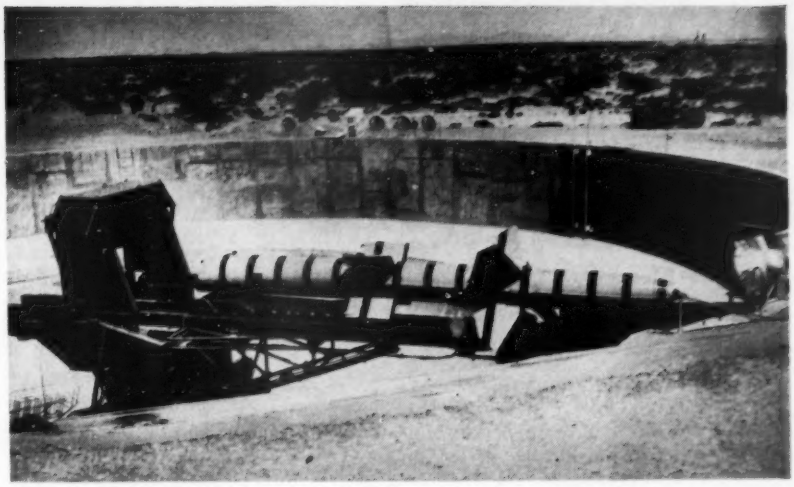
Each Talos Defense Unit includes a missile handling and assembly area and two automatic launchers, each supported by a circular missile storage magazine resembling a railroad roundhouse. Capable of handling missiles with high-explosive or nuclear warheads, the launchers can fire either single missiles or salvos to engage a number of different targets simultaneously and can continue to fire at a high rate over an extended period of time.

Execution of the launching cycle requires no operation personnel whatsoever.

New Research Idea

Hoffman Electronics Corp. plans to apply a new concept in electronic systems management in its $11 million contract for an electronic reconnaissance system for the Air Force.

The new concept, identified as the **Hoffman TEAM** approach (Total Engineering and Administrative Management), was developed to utilize more effectively the outstanding capabilities of recognized specialists. Hoffman, as prime contractor, has full responsibility for the program. The seven sub-system contractors were selected prior to and participated in all phases of the preparation and presentation of the proposal. **They include Cornell Aeronautical Laboratory, Filtron Co., Lockheed Aircraft Services, Olympic Radio & Television; Radiation, Inc., Sanders Associates, and Stanford Research Institute.**



Prototype of automatic launcher for land-based Talos missile.

The contract calls for engineering and development of an electronic system, code name **Tall Tom,** which will detect, record and examine transmissions over a wide range of frequencies and will process the data collected through computers for further analysis. Details of the project are classified.

Nuclear Contract Extended

The Atomic Energy Commission has extended its contract with **Edgerton, Germeshausen and Grier, Inc.** to include work on the nation's program aimed at developing nuclear propulsion systems for rockets and missiles.

Under the extension, EG&G is responsible for installing and operating some of the control and measuring systems planned for use in the testing of nuclear reactors which may lead to the development of nuclear rocket propulsion systems. The project is under the direction of the Los Alamos Scientific Laboratory.

Test Center Expanded

The Department of Defense is planning extension of the guided missile range areas supporting the existing **Naval Air Missile Test Center, Pt. Mugu, Cal.,** to become a **National Pacific Missile Range.**

The range will be managed by the Navy for use of all branches of the Armed Forces. It will be used to support ballistic missile training operations on a tri-service basis. (The range at Cape Canaveral, Fla., specializes in research and development support.) The new range will be equipped gradually over the next few years to support test and training operations of conventional guided missiles and the training operations of ballistic missiles (IRBMs and ICBMs).

Testing Range Improved

The White Sands Proving Ground missile testing range will increase its mission capabilities by almost 25 per cent this year, according to Integrated Range Mission Chief **Col. B. R. Luczak.**

The reason behind the boost is full integration into the range system of **Stallion Site,** northernmost of the range's five chain radar stations, which is now operating as an independent control station. "Our ability to operate Stallion Site independently and without interference is a major step forward in the efficient use of this range, which costs $45,000 an hour to operate," said Luczak.

Contract to Cornell

Cornell Aeronautical Laboratory is in the final stages of setting up a new laboratory office in Washington, D.C., under a $1.5 million contract recently awarded by the **Army Combat Surveillance Agency.**

The contract calls for technical assistance in developing an improved system of combat surveillance for the Field Army. CAL and ACSA personnel are working jointly on the project, expected to last two years. **Dr. Herbert Nye,** assistant head of the laboratory's systems requirements department, has been named director of the group.

The study group has three objectives: to recommend the best combat surveillance system; evaluate existing combat surveillance systems; and lead research into Army organization and tactics.

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Personnel Preview

Pay Raise Interest Still Low

Apparently Congress, and the Nation's press, have yet to be impressed by the Pentagon's assertion that pay raises for key technical people is a vital part of any future U.S. missile success.

The **House Armed Services Subcommittee,** for instance, is conducting its investigations as though the whole problem is merely one of granting routine pay raises. The **Defense Department** bill, on the other hand, is based on the need for retaining highly trained engineers, executives, and scientists—a group on which that U.S. defense is becoming more and more dependent. This contention has apparently been lost on Congress.

At his latest press conference, **Neil Hosler McElroy** was quizzed by reporters for an hour on missiles, budget, and nearly everything else he controls except, snorted a Pentagon official, "Not one question about pay raises."

New Cross-training

The Air Materiel Command has announced a new program to provide cross-training of **quality control** people between plants engaged in manufacture of major missile components and between **industry** and the **Air Force test sites.**

AMC headquarters said the cross training "will assure continuity of quality control actions in all logistic aspects during the life cycle of the missiles."

Specialists concerned with quality control of a missiles electronic and mechanical equipment will be trained at the plant where the missile's airframe is manufactured and vice versa. Other specialists working on, say, the airframe will receive training at the Air Force test sites. The training periods, varying from one to three weeks, will provide the specialists with overall orientation and give them a better understanding of where their particular function fits in the complete program.

Lockheed Picked

The Air Force Institute of Technology has picked **Lockheed's Marietta, Georgia,** division for on-the-job training of officers at the management and policy level.

The executive development training-with-industry program covers, in one year, every management level of operation at Lockheed's Georgia division. The twelve-month program is designed to furnish officers with an executive's viewpoint of industrial management problems with special emphasis on increasing the officers' capabilities to administer problems pertaining to planning, procurement, production and mobilization of industry to accomplish Air Force missions.

ATC Streamlined

Lt. Gen. Charles T. Myers, ATC commander, has announced a streamlining of the **Air Training Command** by discontinuance of its two subordinate **Training Air Forces.** A year will be required to phase our training now in progress at **Scott Air Force Base,** where about 3500 students are presently enrolled in technical training courses.

The elimination of headquarters Flying Training Air Force (at Randolph AFB) and Technical Training Air Force (at Gulfport, Miss., adjacent Keesler AFB) will cut operating costs some $5.6 million annually. Reorganized ATC headquarters will take over the functions of FTAF and TTAF.

Supervision Course

Twenty-five Fort Benning, Ga., civilian supervisors recently completed the **"Introduction to Supervision"** course at the **U.S. Army Infantry Center.** The training program, part of the DA's supervisory development system, consists of two-hour conference sessions every week for five weeks. New supervisors and potential supervisory personnel are required to take the training.

Reserve Lag Seen

Brig. Gen. David Sarnoff, chairman of the board of the **Radio Corporation of America,** declared recently that there have been disquieting signs in recent months that our military reserve program has been permitted to lag, and warned that in the new Space Age our Reserves are "more important than ever before." The "disquieting signs" he saw included what he termed "on and off methods of recruiting and restrictive input for training quotas."

Sarnoff aired his opinion at a dinner of the **Reserve Officers Association** which presented him with its **Minute Man Award of 1958** for "services to his country above and beyond the call of duty which have strengthened our National Defense and established a comforting climate of National Security."

Why Gamble?

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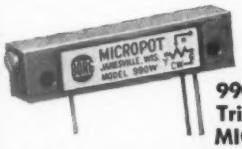

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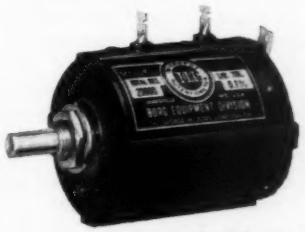

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This Month: Dr. Herman H. Kurzweg

Associate Director for Aeroballistics
U.S. Naval Ordnance Laboratory

IN 1938, a 29-year-old German physicist climbed into an automobile in Peenemunde, Germany. Hanging a finned, bullet-shaped rocket model (which he had carved from a block of wood) out the window, he sailed off down the highway, ignoring speed laws, studying his model's behavior in the "man-made" wind. This model was the first aerodynamic shape of the World War II German-made V-2 rocket.

Twenty years later, that same scientist stood on the rolling terrain at the U.S. Naval Ordnance Laboratory, Silver Spring, Maryland, and watched bulldozers chewing a spot in the ground for his newest project—a 1000-foot precision missile firing range, first of its kind in the world. This evolution in his research facilities is an indication of how closely that physicist, Dr. Herman H. Kurzweg, has been tied to missile research.

Today, Kurzweg, head of NOL's extensive aeroballistic activities, smiles when he thinks about 1938. "We know now that our first effort was no real test, but at the time we had nothing else."

For some unexplained reason, Kurzweg and his team have missed the public limelight which has enveloped other members of the science-missile fraternity, although his team's work has been just as vital to U.S. success in the headline-making, long range missile business. (NOL built the first U.S. hypersonic wind tunnel in 1949, for correct operation at Mach 10, and was the only pressurized range outfit making hypersonic flight—Mach 10-15—studies when the IRBM and ICBM came on the scene. Their basic data was used by all the services in getting their respective programs started.)

Chief of the research division of the German supersonic wind tunnel laboratories at Peenemunde in 1939, Kurzweg moved up the ladder to deputy director in 1943 when the laboratories went to Kochel, Bavaria, to sidestep the Russian army. He came to this country in 1946 and has been with NOL ever since.

From Peenemunde to Bavaria to the United States—he considers this a natural migration for himself and the 12 scientists and engineers coming with him from Germany. "During the first year or two," he says, "we were little more than advisors. We were asked for advice, often, but we never knew why they wanted to know, or if they ever acted on our advice."

All that is changed now. Aeroballistic experts and other top scientists from Germany now occupy some of the key positions at NOL. Kurzweg, for instance, administers one of NOL's most important programs, directs the work of more than 200 people, and is responsible for over $15 million worth of NOL facilities and equipment.

One of the best-liked and most highly respected members of the NOL team, Kurzweg is, in return, proud of

what he terms "one of the best-organized and most successful laboratories in the country, industrial or governmental." (Situated on 875 acres of land, NOL's 150 buildings represent a Government investment of over $50 million. The Laboratory's budget for Fiscal Year 1958 was $34 million, of which 89 per cent came from the Navy Bureau of Ordnance and the remaining 11 per cent from such places as Bureau of Ships, Bureau of Aeronautics, Army, Air Force, Atomic Energy Commission and Armed Forces Special Weapons Project.)

A firm believer in public as well as private research, Kurzweg is concerned about maintaining the high caliber of the government's scientific efforts. He has turned down highly lucrative offers from private industry. To him, it is "unthinkable that government laboratories should be permitted to deteriorate because industry pays more money."

Although Kurzweg admires the Navy way of running R&D ("They seem to know what we need and are nearly always quick to supply it") his administrative job is not without its problems. Among the complaints:

The Budget—"We have shown during the past 12 years what we can do here, but we still have to go after money every year. Why don't they just put us on a fixed budget (as a matter of routine) and let us get on with the work?"

Approval of scientific projects—In 1950, Kurzweg asked for a certain type of wind tunnel, finally got an OK in 1956. If it had been made available in 1954, it would have provided vital answers that were not obtained until two years later, and then only by firing expensive missile prototypes. "We could have had the tunnel for the cost of one or two missiles," he says with a philosophical smile. "On the other side, of course, they could see no apparent need."

Dr. Kurzweg also has definite ideas on other science subjects. Among them:

Communication—It takes too long, at present, to transmit ideas from one brain to another. "We need some faster, better method of communication; some new form, a sort of mathematical simplification."

Education:—One reason the U.S. has trouble interesting students in science is that we don't have enough enthusiastic teachers to tell the students what they can do with mathematical formulation of physical laws. This is one of the reasons Kurzweg and his three department heads (for mathematics, aerodynamics and ballistics) teach part time at local universities, especially at the University of Maryland. "We have to keep in touch with the young people," he says. "It is important to *tell* them what is going on. They don't get it from reading technical pamphlets alone. They need to feel the enthusiasm of the teacher on the subject. It is very important, but very hard, to find young people with real talent in science.

No head-in-the-clouds scientist, Kurz-

(*Continued on page* 28)

Why a Military Subsistence Supply Agency

by Maj. Gen. H. R. McKenzie

Executive Director, Military Subsistence Supply Agency
Chicago, Illinois

The basic reason for one military agency doing a job common to all military departments is obvious: to eliminate duplication of effort. The Military Subsistence Supply Agency (MSSA) handles this job in the area of subsistency supply. Here's how it works . . .

UNDER the single manager charter assigned to us in 1956, MSSA has responsibility for all phases of wholesale subsistence supply for the Army, Navy, Air Force and Marine Corps. We provide food for all of their installations in continental United States and, subsistence originating here, for the oversea theaters.

Although the full task of subsistence supply has been ours for only a little more than a year, our organization has been a single service buying agency since 1941. In that year, as the Quartermaster Market Center System, we began to purchase perishable foods to meet the wartime requirements of the Armed Forces. Then, the System was the fulfillment of the need for a central buying agency whose activities would minimize disruption to the country's food resources during the war; eliminate competition between the Departments; and at the same time supply the fighting forces with good quality foods in necessary quantities when and where required. Before the war ended, we were doing the job from thirty-six market centers directed from a central headquarters in Chicago. For the wartime period, the bill for perishable foods was well over 3.5 billion dollars. We continued the job of buying perishable subsistence after the war and, in 1953, extended our buying operations to include nonperishable foods. Since that date we have been the sole agency for the procurement of all of the wholesale subsistence requirements for each of the military departments.

The Present

Today, our buying activities are conducted by ten market centers and eleven field offices located in important cities of the United States. We also activate temporary field buying offices in various regions of the country during the harvest seasons. In both seasonal and regular procurements, we procure in large quantities and at prices most advantageous to the Government. Our combined purchases each month, covering peacetime operating stocks and mobilization reserves, total about 60 million dollars and 14,000 separate transactions. Procurement is effected at the market centers by contracting officers from all the Departments and by civilian employees with long experience in food procurement. Operating costs are approximately two cents for each procurement dollar expended.

The record supports our contention that the market center program was one of the sign posts that pointed the way toward unification in other fields of supply and service common to all the military departments. In fact, our method of buying perishable subsistence was one of the few noted procedural exceptions permitted in the Armed Services Procurement Act of 1947. It allowed us to continue to negotiate for our requirements in the informal and competitive manner that has long been a distinctive feature of our operations and one which has been generally accepted as sound commercial practice.

It becomes evident, then, that our projection into the single manager area was not without precedent nor experience. Achievements in subsistence procurement since 1941 made the market center system a natural take-off for the extensive venture into unified logistics activities in the Department of Defense. As far as we are concerned, the only difference today is that we now are assigned to do the complete job. Specifically, our task under the single manager concept is first to develop the procurement requirements of the Departments from estimates prepared and submitted by them. Then, after applying quantities on hand or in storage to estimated needs, we enter the market to effect the most economical wholesale purchases. Thereafter, we inspect and approve the foods procured; direct and control their storage in commercial and government warehouses; and monitor distribution to consuming installations. Within this framework, we administer contracts and pay suppliers for goods received. We also supervise the necessary disposal of excess subsistence stocks and disseminate to the Departments all necessary information relative to cost and availability of items of food standardized for military use. Additionally, our job requires that we maintain a level of subsistence reserve stocks consistent with mobilization plans. We also supervise assembly of operational rations at the pilot government-owned assembly line located at the Army Administration Center in Chicago.

We have made significant progress in our first year of full operation under the single manager program. Inspection activities formerly conducted by the deactivated QM Inspection Service Command have been physically transferred to MSSA Headquarters. Concurrently, inspection offices were established under our command at all market centers. They provide inspection services to contracting officers as required.

Supply management of all subsistence, including requisitioning and stock control, is also a delegated responsibility of the Single Manager. In the perishable area, where about 67 percent of our gross dollar purchases are accounted, we have moved rapidly to extend the market-center distribution pattern. Three additional distribution points established at San Diego, Boston, and Philadelphia have facilitated ship-

ment of wholesale perishable food supplies to the newly acquired Naval and Marine installations. The complete pattern now embraces nineteen locations where perishable supplies are maintained in refrigerated warehouses operated by the government or by commercial firms. From them, carload purchases are broken into less-than-truckload or mixed-truckload lots for shipment via commercial transport to using installations. We also make direct shipments from vendor to installations when requirements and quantities make such a procedure more practical and more economical.

Incidentally, existent rate tenders and agreements with commercial storagemen shall permit rapid expansion of the overall distribution pattern in event of emergency.

The Future

An ultimate plan for requisitioning and controlling stocks of nonperishable subsistence has not been established. Several distribution patterns are being considered. Under the plan presently in operation, three geographically dispersed depots are operating as modified stock control points with operations centralized and accounted for at one depot. Activities within designated distribution areas forward requisitions to assigned depots having the modified stock control function. Depots now performing this task are the Utah and Atlanta General Depots and the Richmond Quartermaster Depot. Complete stock control for all depots is accomplished by the QM Data Processing Center at the Richmond Depot.

Modifications being developed are aimed at two targets: the most efficient and economical supply support for nonperishables for all the Services; and the receptiveness of the pattern to rapid mobilization expansion should such become necessary.

Our inventories of subsistence stocks under control of the Single Manager increased by acquisition and procurement during the initial period of MSSA operations. From a high of 164.1 million dollars on March 31, 1957 our total inventory values were steadily decreased to 115 million dollars at the end of the calendar year on December 31, 1957. This total includes nonperishable and perishable peacetime operating stocks; mobilization reserves, including operational rations; and such other stocks classified by us as "in-transit," "government-owned in hands of contractors," "due ins," and "miscellaneous." We expect to continue to reduce our inventories to minimums which will be consistent with timely, economical and uninterrupted supply to the military Departments.

There has been no change in our method of doing business during the transition to the single manager concept. Informal competitive bidding still continues as the procedure for fulfilling requirements. "*Notices of intent to purchase*" are sent to every eligible and interested bidder. The notices advise them of impending procurements. In response, vendors submit offers to their nearby market centers. Market centers relay best offers to the national headquarters in Chicago for final evaluation. Thereafter, successful bidders are notified by and receive contracts from their area market center or from a control market center which may have central jurisdiction over the purchase of individual items.

Inspection methods and delivery requirements are still the same. Goods supplied under contracts must meet established specification standards and delivery requirements.

The same quick payments, usually in less than 10 days, are being made for products delivered and accepted. Funds expended for subsistence by MSSA are reimbursed by the users on the basis of cost-plus-transportation. Billing and collection transactions for perishable subsistence are handled by the individual market centers through the Army Stock Fund, the revolving fund established by Congress to finance all single manager wholesale subsistence procurements. Sales transactions for nonperishables are processed through the QM Data Processing Center at the Richmond Depot.

In our procurement activities, small business, as before, will be assured of a competitive share of our awards, as required by law. It should be mentioned, however, that a major share of our subsistence contracts and more than half of our award dollars are won by small business concerns in open competition. The joint determination or set-aside provisions established for their benefit are additional assurance that consideration is being given to small business.

All of our operations are controlled by two fixed and unchanging principles: (1) we must provide the Armed Forces with good wholesome food in variety and sufficient quantity when and where needed; and (2) we must do the job with the economy and efficiency demanded by law in spending tax money. We have no other purposes in entering the national market. At no time do we buy to speculate or to support prices.

Under these objectives and within the augmented market center organization, MSSA has progressed well in its first year in fulfilling the purposes of the single manager program as supplied to subsistence. The extra tools added to established buying practices permit us to do the complete supply job effectively. Results to date have indicated the soundness of the underlying principle of unified activities. The Single Manager program has improved the efficiency of military subsistence supply operations. It offers the broadest participation in government business to producers, vendors, transportation and storage business firms. Single manager functions eliminate duplication of effort, and provide economies in operation, as anticipated.

Pentagon Profile

(*Continued from page* 26)

weg likes to work on a basis of about 50 per cent basic research ("everything starts with this, we should do much more") and 50 per cent hardware ("to keep our feet on the ground"). "Today's missile research," he says, "is very different from building yesterday's airplanes. You built a model of an airplane, put it in a wind tunnel, saw how it behaved, and modified the design so it finally flew the way you wanted. With missiles and hypersonic airplanes, we need several types of facilities—wind tunnels, shock tunnels, precision firing ranges, rocket models—because the hypersonic flow fields are so complex that model simulation of a full-scale vehicle is practically impossible in a single facility. We get certain information in wind tunnels we can't get on firing ranges, certain information from firing missiles which we can't get any other way."

On the science race with Russia, Kurzweg says, "In the science field, it is not correct to say that any nation, or small group of people, can get far out ahead of the rest of the world in scientific knowledge. Even the German aerodynamics effort in the early 1940's was not greatly advanced over what was being done in the rest of the world in the field. What they do with that knowledge is another matter."

Dr. Kurzweg has interests other than those wrapped up in missiles and aeroballistics. He and his wife, both naturalized U.S. citizens, have three children—Urich, 21; daughter Diemut, 17; and son, Lutz, 15. His oldest son, a physics graduate of Maryland University, is very reluctant to ask for his father's help. "He doesn't want anyone to accuse him of taking advantage. He wants to do everything on his own. Maybe," Kurzweg says, in a hopeful tone used by all fathers at some time or other, "when he's a little older and this independence is not so important, he'll let me help."

The Technical Publication Manager—

The Forgotten Man In Defense Industry*

First Of A Series
by Roswell Ward

Technical Publication Management Consultant

SINCE manufacturers of military equipment must prepare, to a point of readiness for printing, all of the instruction books needed to operate and maintain the equipment they supply, there are several important points in regard to this effort which are not generally known. Some of these points require more facts to fully illuminate them. All of them point to a need for urgent and decisive action:—

1. American defense contractors are collectively operating the largest technical publication organization in the free world (1) for preparing the instruction books to keep defense equipment in a state of combat readiness. (This statement is substantiated even by the incomplete statistics which now exist, a sampling of which are presented in this article.)

2. American defense contractors are by far the largest employers of publication managers, editors, writers, and illustrators and graphic arts specialists. Directly, or through subcontracting, industry employs *more* publication managers, editors, and writers than all of the country's newspapers, magazines, business and trade and technical journals, advertising and public relations activities, and educational, research, and textbook organizations combined. (This estimate will be documented by statistical comparisons to be published in a future article.)

3. There is evidence, which requires further study, that many types of military instruction books are not actually instruction books, but are mainly suitable for use as reference books. The entire teaching load for instruction of new personnel or for instruction on new equipment falls on military personnel or on the manufacturer's civilian service representatives. Sometimes these specialists have to "explain the instruction book" as well as the equipment under discussion!

4. The art and science of technical publication management has reached its highest development in the executive direction of textbook publishing, the publishing of technical journals and some types of "popular science" magazines, and in some educational and research activities.

To those of us who have had experience in one or more of these activities, technical publication management in industry, particularly in the preparation of military instruction books, often appears to be absolutely chaotic. At the least it would appear that industrial top management has not benefited from long established experience in technical publication management, although there has been limited publication of technical publishers' management experience. At the worst it would appear that industrial top management, "middle management," and many management engineers have permitted the technical publication manager to become "the forgotten man" in the industry-armed forces management team.

Management

In this discussion the term "instruction book" is used as a general term to include operating manuals, repair and overhaul manuals, and illustrated parts lists. Napoleon said that an army moved on its stomach, but today the armed forces depend more than ever before on good equipment instruction books. There is virtually no combat duty or duty in maintenance of combat readiness that does not require instruction books on the operation and maintenance of complex weapons or weapons systems. It is not enough for industry to recruit competent technical editors, writers, illustrators and publication production specialists. We cannot carry out our obligation to the armed forces and to our citizens, who demand the best in every phase of the defense effort, unless we are certain that we have developed the highest attainable skills in the management of our publication activities. To illustrate how much needs to be done, some questions are in order:—

1. *What Do We Know About Technical Publication Managers?*

(a) Have we any representative, well-documented picture of the problems that publication managers have faced, are facing, and will face (under more intensive conditions) in the future?

(b) Do we know the qualifications of a good publication manager?

(c) Do we realize the grave responsibility which rests on the publication manager in developing the best attainable military instruction books?

(d) Do we recognize that publication management is a highly skilled profession which urgently requires adequate recognition?

(e) What are we doing, in industry, in the armed forces, in management engineering, and in our schools of engineering and journalism to develop more competent technical publication managers?

2. *What Do We Know About Technical Publication Management?*

(a) What have we, in specialized literature, on problems of publication management in all types of organizations, civil and military in general, and in defense contractors organizations in particular?

(b) Is industry doing anything to promote the interchange of information and experience on all phases of publication management, organization, personnel, research in improved techniques, and research in the effectiveness of military instruction books?

(c) What is being done, in this respect, by management engineers, trade and industrial associations, and institutions of higher education?

The answer to all of these questions is, unfortunately, *practically nothing!* If individual manufacturers have made progress in developing a more adequate concept of technical publication management they have apparently been reluctant to publish this information. The American Management Association has informed me, in an interview with one of their executives, that in several years they have had no requests from manufacturers on publication management problems. ACME, the Association of Consulting Management Engineers informed me, in an interview with their Executive Secretary, that some of their member organizations had probably studied publication problems in general man-

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agement surveys. However management engineers cannot disclose their clients nor their survey reports. Most college, university, and technical school courses on publication work are merely courses on technical writing! (2) The Journal and the programs of the newly expanded Society of Technical Writers and Editors (which had 600 registrants at a recent national meeting) are predominantly editorial in scope. There are some papers in the meeting programs that involve conformity with military publication specifications, but there has been very little coverage of management problems.

To make it quite clear that technical publication work in defense industry is not only a responsibility of far-reaching importance, but also "big business" in its own right, some of the very limited statistical data available is well worth studying:—

Some Estimates

An estimate published in the *New York Times* in 1955 states that between 3 and 5 percent of our military budget is spent on the preparation and printing of manuals for instruction of armed forces personnel in the operation and maintenance of military equipment. This means that, two years ago, at least $600,000,000 "was being paid for the printed words and drawings to keep our national defense (hardware) in order. And civilian industrial manuals cost as much as the total spent for defense equipment manuals." That means that well over a billion dollars for equipment instruction books was spent in 1955 (3).

Another estimate, published in the *Wall Street Journal* in December 1956 (4) reports "the Government estimates it spends close to $250 million annually for the *preparation* of technical works." The source of this estimate is not given, but it is not inconsistent with the *New York Times* figure as that estimate includes *both preparation and printing*. The printing of military instruction books undoubtedly involves a considerable outlay as they often have very long press runs and frequently require the use of color, fold-out charts and drawings, and bindings which will withstand the rigors of field service. The Naval Aviation Publication Facility in Philadelphia, for example, reports that its printers issue "8,000,000 pages per week." (5)

There are no statistics currently available on the number of manufacturers who maintain technical publication departments although Robert Hamlett, formerly Director of Technical Publications for the Sperry Gyroscope Company estimates there are about 3000 technical publication managers, editors, and writers employed in the aircraft industry alone. (6) There are also about 200 technical writing services in the country, some of them one-man outfits and many of them large organizations with a sizeable staff of editors, writers, illustrators, draftsmen, and photographers.

Publication Departments in industry may be large units, staffed not only with editorial and illustrating personnel but with a more than average complement of clerks and stenographers. The Sperry Gyroscope Company has a publications staff of about 300; Glenn L. Martin Company was reported in 1956 to have 279 employees in its publication department; Pratt & Whitney Aircraft has upwards of 80 "technical authors" on its publication staff; I.B.M. has employed, for producing manuals on the SAGE radar warning system, a staff of 160, 75 of them technical writers.

These are sparse figures and they are not up to date. However every defense contractor and subcontractor must supply military instruction books to military specifications. Hence, every unit of defense industry either maintains a publication department or subcontracts the work to technical writing services, many of whom are building up an impressive record of service to the industry-armed forces team. (Some of these services also serve as prime contractors on some types of military publications and on a wide range of technical, scientific, and research reports.)

On a basis of comparison with technical publishers in the book and periodical fields, I am convinced that there can be a great deal of improvement in publication management in industry, and in the quality and effectiveness of military equipment instruction books.

On a realistic "case study" basis, a series of "danger areas" in publication management will be defined in this series of articles together with constructive suggestions as to how to deal with these problems. Since industry accepts the contractual obligation to prepare military instruction books, industry unquestionably should accept the responsibility of making—and permitting publication—a searching evaluation of existing problems (and existing achievements) in technical publication management. Only in this way can we be assured that American management genius can measure up, in its production of military instruction books, to the standards set in the development and manufacture of advanced types of military equipment.

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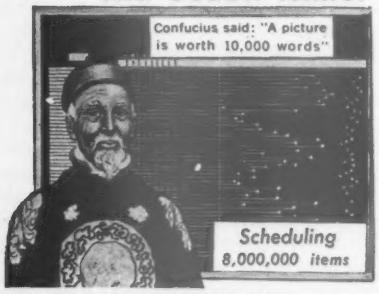

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Dates to Circle

March 11-13

Missile Guidance Symposium—Wright-Patterson AFB, Dayton: sponsored by the Air Research and Development Command.

March 14

Hospital Management Conference—Hotel Commodore, New York City: sponsored by Society for Advancement of Management.

March 17-28

National Resources Conference, two sessions being held concurrently—Morris Harvey College Auditorium, Charleston, W. Va.; and University of Pennsylvania Museum Auditorium, Philadelphia, Pa.: sponsored by the Industrial College of the Armed Forces, Extension Division.

April 22-24

Electronic Components Conference—Ambassador Hotel, Los Angeles.

May 25-28

National Office Management Association Conference—Conrad Hilton Hotel, Chicago: sponsored by NOMA.

The PX in Perspective

Once again this year the Army and Air Force Exchange Service is under strong attack by a private retail lobbying group in Congress. Here, in an exclusive story, is the Exchange Service answer to their charges . . .

by Maj. Gen. H. C. Parks, USAF
Chief, Army and Air Force Exchange Service

THE primary mission of the exchange is service, providing merchandise and services when and where military personnel and their dependents require them, at a price they can afford to pay. This requirement has pushed exchanges into worldwide operation, wherever security demands that American troops be stationed.

The exchange is the center of much of an installation's social and community life. Major Army and Air Force commands throughout the world operate 2600 retail outlets, 490 cafeterias, 1090 snack bars and soda fountains, 1600 service outlets—such as guest houses, automotive service stations and the like, and some 5800 civilian-operated concessions which furnish dry cleaning, laundry, shoe repair, barber and similar personal services. The Exchange Service furnishes technical assistance and supervision to the commanders in this operation.

Some 65,000 civilians staff these activities under the supervision of about 350 military personnel. In FY57, the total sales amounted to $829.6 million, $467.3 million of it from oversea operation. Almost all of the $56.3 million profit was returned to the soldiers and airmen in the form of hobby shops, day rooms, libraries, athletic programs and facilities and other off duty time entertainment and recreational activities.

The exchange operation must pay out of earnings almost all the costs (except building rent) of doing business; the wages and salaries of its civilian personnel; the cost of merchandise, show cases, lighting fixtures. Some $17,000,000 was spent last year improving the interior of the buildings furnished for exchange use (the exchange receives gratis only the shell of the building).

The only other advantages the exchange system enjoys are the services of the relatively few officers assigned to exchange supervision, and the facilities of MSTS in moving merchandise to oversea destinations. In the United States, exchanges even reimburse the Federal Government for the heat, light, water and other utilities used.

In the past nine years retailing associations have succeeded three times in having the House Armed Services Committee conduct hearings on the exchange privilege. In 1949 this resulted in drastic curtailment of the merchandise and services domestic exchanges could offer their customers. In 1953 it resulted in an endorsement of the importance of the exchange privilege and criticism of the retailer association's stand. In 1957 it resulted in approval by the House Committee to extend the scope of merchandise which is authorized for domestic exchanges to include, among other things, children's clothing, baby furniture, maternity dresses and similar essentials.

Yet the battle is far from over. The National Retail Merchants Association has publicly stated recently it will again press for further review and reduction of the Exchange privilege. Here is a brief 5 pointed reply to some of their major assertions with our answers:

The exchange competes with civilian merchants . . .

The exchange operates on a military reservation to serve military personnel. Total domestic exchange volume represents less than two-tenths of one percent of American civilian retail sales. The average serviceman spends less than twenty percent of his pay in an exchange with some eighty percent of it then available for spending in the local community. Exchanges buy locally. They hire local townspeople. They utilize local commercial services. Local businessmen are engaged as concessionaires. Dividends are spent locally. Thus, the exchange has a beneficial impact on the economy of the civilian community.

The exchange represents government subsidy . . .

Actually exchanges pay almost all costs of doing business with the exception of rent and the pay of the relatively few officers assigned to exchange supervision. Considerable sums ($17 million last year) are spent improving the buildings used by exchange activities. As to officer's pay, in the entire worldwide exchange system there are only about 350 officers, and many of these have additional duties other than exchange supervision.

Exchanges have expanded over the original 1895 concept of "items of convenience and necessity" . . .

We agree that horse blankets, snuff, sabers, knives and whiskey and other 1895 items are no longer found in today's exchange. Exchanges must move with the times. More than three quarters of what the average customer spends in his exchange goes for simple everyday necessities such as drug store-type items, tobacco, soft drinks, snacks, stationery and magazines, uniform accessories and the like.

Exchanges sell to unauthorized customers . . .

Exchanges operate under a rigid identification card system, carefully policed, sternly enforced. Military personnel are constantly indoctrinated in the importance of strict adherence to these rules and regulations. Sales clerks receive intensified training on this subject and are constantly being checked to make certain they do not become careless. No evidence of any widespread abuse of the PX privilege has ever been offered by the retailing organizations.

The Exchange Service is too important a morale activity to be jeopardized by loose and inaccurate charges. The only certain way the exchange privilege can be protected is if all personnel concerned with its operation are familiar with the exchange story and assure that it is widely disseminated. Only then can we hope to achieve the understanding and support which this activity so well deserves from the civilian community.

XUM

Sperry to Manage B-52 ECM Program

The U.S. Air Force confirmed that it has named **Sperry Gyroscope Co.** ECM weapon system manager, responsible for the development and production of electronic countermeasures (ECM) for the **Strategic Air Command's** B-52 long range bombers.

Identifying Sperry as prime contractor and manager for the B-52 ECM program, **Lt. General C. S. Irvine, USAF** Deputy Chief of Staff, Materiel, revealed that the "multimillion dollar associate contractor type of contract is the first such Air Force contract awarding system manager responsibility in an avionic sub-system area." Under this form of contract, Sperry will work in association with the airframe manufacturer, Boeing Airplane Company, and will marshal the talents of industry toward an advanced, integrated ECM package.

Sperry will "farm out" approximately 45% of the total work to other specialized organizations.

Driverless Tractor

The illustration shows one of five heavy duty **Guide-O-Matic** tractors now in operation over a three mile route at the **North Kelly Field** warehousing area of **Kelly Air Force Base,** San Antonio, Texas.

Five warehouses are served with the present system, and the driverless tractor trains run indoors, outdoors, across railroad tracks, and up and down ramps, without any need for human concern about their performance.

These electronic tractors are guided by a wire embedded in the floor, and the tractor automatically obeys signals; such as traffic lights, stopping stations and other functions.

A rotating red light similar to that used on police cars and ambulances warns of the approach of the automatic Guide-O-Matic tractors, and a bumper on the front of the tractor stops the train immediately upon contact.

ASPR Under Fire

Claiming they will hamstring U.S. research and development efforts, **industry** is fighting restrictions being written into the **Armed Services Procurement Regulation.**

Why the restrictions are being written has not been explained. Opinion seems to center on one of two possible reasons: a campaign to assure a bigger role for Government laboratories and arsenals; or, a belief that industry is rapidly pricing itself out of the R&D business.

One "under-fire" restriction gives the Government the unlimited right to use data developed under Government research and development contracts which, it is claimed, would permit the Government to hand over technical data developed by one contractor to another without compensation. Opponents say this would seriously injure small business which "gets most of its business as a result of technical know-how."

Another restriction, with perhaps more far-reaching effects, is now under study, would revise Section 15 of ASPR regulations relating to allowable costs. Under the proposed restriction, related research would not be allowed as a cost against research and development contracts. The proposed regulation tries to draw a sharp line between related research and general research in order to permit special treatment of related research. Complaint is that it ignores: (1) the overhead nature of all research expenditures, and (2) the essentially reasonable and direct relationship which often exists between related research and the end products of R&D contracts.

Driverless transportation performs at Kelly AFB—see story above.

Procurement Probe

A **year-long** probe of the competency of **Defense Department procurement** officials is still being quietly conducted by the **Hebert Investigations Subcommittee.** A report is expected, but no date has been decided. One situation almost sure to be mentioned (which the Pentagon has known and been trying to correct for some time): men with the same pay rating in military procurement frequently hold down jobs which vary a great deal in responsibility. Another: the Services have been very fortunate in retaining some top procurement people in spite of the facts they often deal with industrial counterparts with the same experience but twice or three times the income.

AIA Opposes Bill

Aircraft Industries Association is the only trade group officially on record opposing H.R. 8002, the accrued expenditures bill, now being studied by the **House Appropriations Committee.**

Normally AIA does not take an active role on Capitol Hill. However, **Gen. Orval C. Cook, AIA president,** says the innocent-looking bill would have extremely dangerous effects on the defense program. Among the difficulties inherent in the bill are: (1) forcing the Services to program annually for production of items which it frequently takes several years to make; (2) forcing the Services to go back to Congress or to stop work if spending estimates proved (as they usually do) to be inaccurate.

The Pentagon originally opposed the bill, suggested by the Hoover Commission. However, the White House supported the bill in line with its attempt to control cash outflow from the Treasury. As a result, Pentagon officials later withdrew their official opposition to the proposed legislation. Majority of the House Committee is against the bill.

SAC Should Use Commercial Maintenance

Tremendous saving in cost and technicians in **Strategic Air Command** dispersal could be attained by using commercial facilities "which are ready made for dispersal now," claimed **Rep.**

Harry Sheppard (D-Calif.) recently.

Speaking before the House, Sheppard said he viewed with alarm the drop-off of commercial aviation maintenance business. While government maintenance shops are currently employing 140,000 first-line technicians, Sheppard said, private industry is laying off thousands of similar personnel. Of $1.5 billion in Navy and Air Force maintenance costs, he said, only 3% goes to competitive bidding. In addition to less cost, said Sheppard, the plan would use the $100 million government investment in commercial plants, which are presently operating at 50% capacity.

Improve Inspection

A method has been worked out by Ordnance people for improved inspection and acceptance of products manufactured for the Army.

This has been accomplished through a simplified system for evaluating a contractor's quality control system to determine its adequacy and his company's conformance to it.

The Army's Ordnance Tank-Automotive Command has been directed to conduct Quality Assurance Training for all of Army Ordnance, it was revealed by Victor R. Anderson, Director of the Inspection Training School, and Edward C. Slayman, Chief of Quality Control, at OTAC's Detroit Arsenal.

The new industrial system for guaranteeing the quality of products, "Quality Assurance," is a "reasonable guarantee of product conformance to establish standards without the necessity of minute product examination and testing."

New Truck Designs

Entirely new designs of tractors built around air suspension systems can reduce vehicle weights by almost a ton, General Motors Corp. truck engineer Donald J. Labelle stated recently.

With most of the high-frequency road vibrations and shocks absorbed by the air suspension system, structural strength requirements will be much lower, and lightweight materials such as aluminum, magnesium and fibreglass-reinforced plastics can be substituted for steel, LaBelle said.

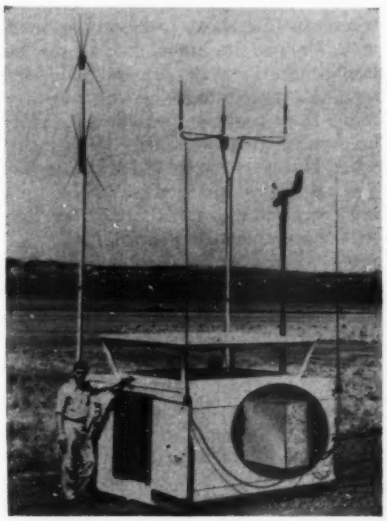
AMC Re-shuffle

A major reorganization of the Air Materiel Command's procurement and production organization has been approved by General Edwin Rawlings, AMC chief. Under the reorganization, weapon system project offices move "out of the AMC cellar" to report directly to Maj. Gen. William Senter, AMC's director of procurement and production.

There can be no further question, according to informed sources, that the badly abused weapon system project offices will now have the authority to make decisions. They will also be responsible for procurement. In the past, these offices have acted only as a coordinating unit and have been blamed for delaying decisions which both industry and the Air Force found necessary.

Lightweight Huts

Lightweight huts are now being made of rigid urethane foam by an East coast manufacturer. Covered on both sides with a thin skin of aluminum, they are trademarked Helicop-Huts and can be transported easily by helicopter or truck, or placed on rollers



and made mobile. They are now being supplied to the military for uses such as air traffic control or message centers, weather stations, and photographic laboratories. Cut inset shows urethane foam filling material which bonds together the two sheets of aluminum used for exterior and interior hut surfaces.

Polaris Speed-up

An urgent program to prepare for ground testing within the next few months of the recently accelerated Polaris fleet ballistic missile has been announced by the Navy.

A multi-million-dollar building project of huge concrete and steel missile test stands and special related buildings will be located at the Lockheed Missile Systems division's 4000-acre remote test site in the Santa Cruz mountains south of San Francisco.

Static or ground testing of missile parts at the new facility will take place under conditions closer to actual flight conditions than any other method short of flight. Goal of the tests will be to increase system reliability, decrease over-all test program costs and speed availability of the operational Polaris missile.

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Where Leaders Find Ideas

by Lt. Col. William H. Hunt, AGC Instructor
The Adjutant General's School

THE French Marshal Maurice de Saxe and Baron von Steuben founded their systems of organization, which changed straggling mobs into disciplined troops, upon the one controlling idea that when men are trained to think about moving together they can be led toward thinking together.

Thinkmanship then is corollary to Leadership.

Within the framework of our military system it is always possible to achieve both obedience and discipline without destroying independence and impulse. This has been true from the days of our Revolutionary War when Baron von Steuben is reputed to have written to a brother Prussian officer, "You say to your soldier 'Do this!' and he doeth it; but I am obliged to say 'this is the reason that you ought to do this' and then he does it."

Yet, today there remains an opinion that military service has a limiting effect upon the use of imagination by individuals, because military restrictions force people to do as they are told and permit no freedom of action. There is a very great difference between freedom of action and freedom of thinking. Leadership develops a favorable climate for freedom of thought just as assuredly as leadership achieves unity of action in a combat situation.

There is no place in the Armed Forces for those who cannot or will not make decisions or who view the future with pessimism. The leader who falls into the trap of negative thinking will eventually become fearful of any action that he must take. He will be incapable of sound decision because his habit of thought will have robbed him of the positive thinking so fundamental to the making of a sound decision. Even though he may agree with decisions that are thrust upon him, his mind will remain unchanged and the spirit of his compliance will be grudging.

Every human is capable of thought. Rules, regulations and other restrictions may still man's mouth but seldom his mind. Ideas striking the right persons at the right time have created inventions which have opened new horizons for all mankind. Ideas striking obscure individuals, at the right time, have created leaders to rise to the needs of a cause or a nation. Ideas shared by people have fomented revolutions.

Leadership recognizes that in every unit or organization there is an artesian well of ideas that keeps bubbling up from an effective, mass producing idea factory. The effective leader goes out where he can hear and sample these ideas because he knows he can do this best when he sees as well as being seen. He recognizes that he must be more than a name posted on a door or signed to papers. He knows that when his subordinates get to know him and recognize his interest in the unit, as a real and vital thing, that they will share their ideas with him.

No Monopoly

No one is so smart that he has a monopoly on ideas. The leader who believes that he has an inherent ability, based upon past experience or training, to provide most of the ideas for his staff or his unit soon finds that he is solving all of the problems of the unit. When this happens he will have an organization which not only can do nothing without his word of approval, but one which will not solve a problem without referral to him. Subordinates must present solutions to problems—not problems. They must apply their own thought to the solutions of problems. The leader must apply his thinking to the propriety of solutions—subordinates must apply their thinking to the creating of solutions. This is a matter of education.

It is the responsibility of leadership to develop, in all subordinates, the ability to think and plan for the improvement of the unit and the service. A feeling of belonging is generic to esprit. In every unit in which there is good morale, spirit or whatever it may be called, it exists because that unit is populated by belongers . . . individuals who have ideas and are permitted the voice to express those ideas. Lack of a common purpose is one of the greatest sources of unhappiness in any group. When it is lacking, men operate as individuals each striving for his own place and fighting for his rights . . . his own, not the unit's. Speaking of the Army of World War II, General Eisenhower has said: "There is among the mass of individuals who carry rifles during a war a great amount of ingenuity and efficiency. If men can talk naturally to their officers, the product of their resourcefulness becomes available to all."

Training and education at all levels calls for the constant development of an ability and desire of subordinates to think. It is the responsibility of all leaders to insure that those who will follow them into their positions of responsibility and authority know more about those positions when they take over than the incumbent did when he took over. This will be accomplished by the encouragement of the expression of ideas and opinions rather than a judgment of their probable worth when measured against the gauge of experience. Because an idea, a process, or a recommendation did not succeed for the leader is not positive proof that it is forever worthless. It is more than remotely possible that the idea, when first presented, was couched in the wrong words, was submitted at the wrong time, to the wrong person or was presented as little more than a hunch, and thus required a decision which has been defined as "the action an executive must take when he has information so incomplete that the answer does not suggest itself." Because the idea was new or different and not within the experience of the leader making the decision, it was rejected.

Such rejection is not unusual because there is a fear in all men of the new, the different, the unusual—just because it is new. The old and familiar methods are the best understood and the easiest to employ so, in our own defense, we tend to ridicule and to underestimate those things which we cannot, do not, or will not understand.

The corridors of history are lined with monuments to man's inability to grasp a new idea. The Revolutionary War might have been indeed shorter and had a different ending had General Howe been more concerned with the effectiveness of the Furgeson rifle (and

the corps of British troops which young Major Patric Furgeson organized and equipped with his invention) than with his personal dislike of this upstart junior officer. Why else would he have disbanded this organization and placed their weapons in storage? The Civil War, too, might have been considerably shortened had not a Chief of the Bureau of Ordnance been so convinced that a muzzle loading musket was supremely adequate to create casualties among the enemy. So convinced was the General Officer (based upon his combat experience), that he rejected as a "newfangled jimcrack" the Spencer carbine. Yet it was this weapon that played a large part in making the battle at Gettysburg a Union victory.

Most basic conceptions are old rather than new. The new idea is more often than not a new twist on an old idea. Perfection is usually attained when the idea is simplified down to its essence, not by complicating it. This is possible when the greatest amount of knowledge can be brought to bear on the question or problem. Total research is the answer to creativity because the more that is known, the greater the possibility of learning more. Distillation of an idea is best accomplished by the minds of several individuals. The process which we call The Estimate of the Situation contains in its five steps the process by which imagination, through a creative process, originates a solution.

Our greatest leaders have been those imaginative men who recognized and tapped the source of creative ability available to every leader . . . the minds of the enlisted and commissioned personnel who man the armed forces. Everyone has ideas. Some people do something about them. Others take the line of least resistance, say "the old man wouldn't go for it" and let the brainstorm go down the drain. Nevertheless, wherever there are people there are ideas . . . ideas that can improve the efficiency of the unit . . . ideas that can convert a nonbelonger into a belonger. Leadership can ferret out those ideas . . . leadership is the incubator that hatches a hunch into an idea . . . leadership is the nourishment that sustains ideas until the chain reaction of group ideation creates a workable solution.

Call it a "bull session." Call it a conference. Call it a brainstorm. Call it whatever you will, but call a meeting of your people, tell them your problems and then ask for solutions. The solutions are there in their minds. Some are good, some are bad and some are indifferent. They exist as hunches, gripes and suggestions. However, they'll be expressed when leadership recognizes and accepts the facts that communication is a process of both sending and receiving and officers must talk naturally to their men.

Use these measurements in the appraising of ideas:

There is no such thing as a silly idea . . . only silly people who laugh at ideas.

There is seldom a new idea, its just an old one with a new twist.

It isn't the newness that counts, its the workability that matters.

Originality is merely a matter of taking that which you have seen, heard or read and adding yourself.

You just can't tell where an idea will come from. Neither can you tell who might be the one to find it. Leadership, however, because it is based upon creative thinking, will know what to do with it.

How to Handle Records at Half the Cost

A revolutionary new system for filing officer personnel records has been set up at MATS headquarters.

Replacing approximately 40 old-fashioned four-drawer file cabinets, the eight units pictured (right) are now in use by the Officer Division of DCS/-Personnel, MATS.

New to the Air Force, the system features special cabinet equipment called Rotor-Corres-Files, in which shelves revolve on a "lazy susan" principle, providing easy access to the entire contents of each huge shelf at any time. In operation at the Military Air Transport Service this has meant file clerks could handle twice the previous number of officer records assigned each individual, with greater speed and efficiency. (Before installing the new system, it took eight clerks to handle the workload—there are now four—and they had to walk from 20 to 120 feet to obtain records. Another drawback, eight clerks had access to all records, caused delays, confusion, difficulty of fixing responsibility.)

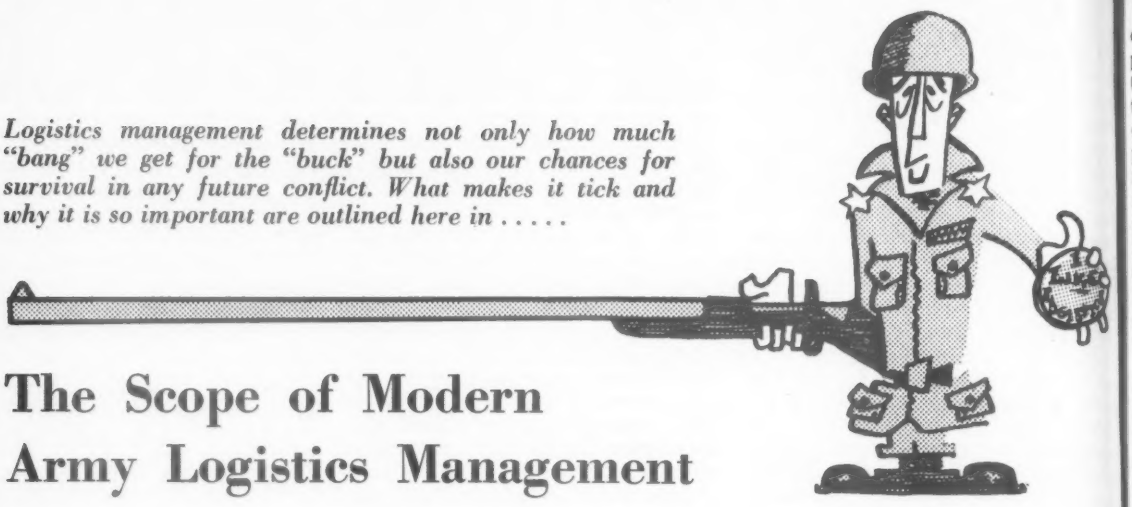
In an operation the size of MATS', which handles some 15,000 individual officer records, the new system represents a saving of more than $6,000 in the first year (plus additional savings of overhead costs) on an investment of less than $6,000.

Each unit contains the material formerly held by nearly five of the old style units at MATS.

Bonus for MATS: new arrangement requires 417 square feet of floor space, 60% less than the previous setup.

Background information: the new system has picked up wide acceptance in military hospitals (such as 1100th USAF hospital at Bolling and the new Scott Air Force Base hospital—which has some $27,000 worth of the equipment), but this is one of the first applications of the system to a different type of operation in the Air Force.

Logistics management determines not only how much "bang" we get for the "buck" but also our chances for survival in any future conflict. What makes it tick and why it is so important are outlined here in . . . . .



The Scope of Modern Army Logistics Management

by W. J. Garvin
Deputy Director of Financial Operations Department of the Army

COMPARISONS between separate elements of Army logistics and "big business" have become commonplace. There are, of course many instances where such comparisons can properly be made. Numerous logistical activities, however, have no close counterpart, in terms of scope or purpose, within the private economy. Piecemeal comparisons, moreover, are often more striking than useful in that they fail to illustrate the scope and complexity of logistic operations as a whole.

The sum total of Army logistics operations may better be described as comprising a specialized kind of economic system supporting a semi-autonomous military community. This community exists within and depends upon the greater U.S. community but is, in many respects, apart from it. It has a distinctive "way of life," including a long tradition of honorable service to the nation, its own code of justice, a specialized training system, a time-tested organizational structure.

The U.S. Army community proper contains close to a million men and women in uniform and over four hundred thousand civilian employees, plus 1½ million men in reserve units and the National Guard. It occupies some 82 major posts, camps, and stations in the U.S., its territories, and foreign countries. It operates 46 industrial facilities, 40 depots, 24 ports and 93 hospitals. Its real property investment is valued at over $24 billion. Supplies and equipment valued at more than $20 billion are stored in depots and other installations in the U.S. and overseas to support its peacetime operations and provide essential combat reserves. Its annual expenditure approximates $9 billion.

Clearly the management problems encountered in furnishing logistics support for a complex organization of this kind are more akin to the problems of managing an economic system than they are to those encountered in even the largest business enterprise. In fact, if we can claim that we have a logistics management system at all, it is only in the sense of a central supervision of a great many different and specialized management systems.

Problems of Economy

Army logistics management in its broadest sense is basically a problem in economy, that is, a problem of marshalling, directing, and controlling resources in such a way as to develop and preserve a maximum capability to support Army missions in peace and in war. Within this total problem of economy are three separate but interdependent problems:

(1) The first of these is the problem of economy of forces. This is the problem of deciding, within total available resources the kinds and numbers of units that, in combination, will assure maximum potential effectiveness in the kind or kinds of war that we may have to fight. It is a primary problem of the Joint Chiefs of Staff in the formulation of strategic plans and assignment of tasks to the several Services.

Requirements for and the cost of logistics support of various possible force structures are major and often dominant considerations determining these final decisions. The principles and assumptions from which these decisions stem must be kept under continuing review in the light of rapidly changing weapons technology, current evaluations of the intentions and capabilities of possible hostile forces, and ever new perspectives on the future battlefield.

Solution of this primary problem of logistics management calls for military judgment of the highest order. The decisions stemming from it determine not only the amount of "bang" we get for the "buck" but, of paramount importance, our chances for survival in any future conflict. Clearly, all other decisions as to the management of logistics resources must be subordinate to these military objectives and must support them fully.

(2) The second problem is that of economy in programming. This is the problem of phasing over a period of time the actions required by decisions as to force goals and structures and related war plans. Army programs phase the achievement of these objectives over a five-year period. They incorporate such major assumptions or forecasts as changes in weapons technology, current and planned production schedules, relative reliance to be placed upon the active and standby mobilization base, and the future strength and deployment of Army units.

The logistics aspects of these program decisions require a mixture of military and civilian capabilities of the highest professional caliber. The skills of the military planner, the scientist, the engineer, the statistician, and the production manager are joined in decisions that determine the degree of economy with which basic Army resources are applied and which guide its day-to-day operations over an ex-

tended future period.

(3) **The third problem is that of economy in operations.** This is the problem of economy in the application of resources to such day-to-day activities as procurement, manufacture, distribution, maintenance and manpower utilization. The term "management," when used in its narrowest and most restrictive sense, usually relates only to this aspect of logistics management. Methods and procedures borrowed from private business most readily apply to it and it is the most frequent target of charges of military waste and inefficiency.

Discounting the frequent dramatic exaggeration of newspaper headlines, such charges often are based on a solid foundation in fact. No large enterprise entirely escapes instances of waste and inefficiency and they can be expected to occur more frequently in a logistics system that comprises numerous large enterprises. Further, I am sure that you will agree that a nation would court disaster if it required its military logisticians to be selected primarily upon the basis of their capabilities in the area of management. This is not to say that Army logisticians should not or do not give full attention to it. New and, in some respects, revolutionary concepts of logistics and related financial management have been introduced over the past ten years in efforts to increase the efficiency of Army logistics operations. The military logistician must be and is fully aware of the great importance of operational economies since they limit the effectiveness of programming and capability to support force objectives. But he must also view them in the perspective of logistic management as a whole and in relation to over-riding military objectives.

Systems Affecting Plans

Army logistics management is a part of and operates within a family of management systems applicable to the Army as a whole. I shall deal with only three members of the family.

(1) **First and foremost is the Army General Staff**—a unique and highly effective management system in its own right.

Members of the General Staff Corps must be highly competent in their respective specialties, but, more important, must also be able to act for the Chief of Staff with full understanding of the needs and interests of the Army as a whole. Competence of the highest degree in a specialized area does not by itself qualify an officer for the General Staff Corps.

General Palmer points out in a recent issue of ARMED FORCES MANAGEMENT that two major fallacies grew up around the General Staff concept between World War I and II. The first fallacy is that each General Staff agency should bear a "G" designation and that there should be no more, and no less, than a total of four. This fallacy impeded timely recognition of important new functions or significant changes in the relative importance of older functions. The "G" designations have disappeared since World War II.

A second major fallacy asserted that the General Staff "does not get into operations." In fact, it exercises the authority of the Chief of Staff and "operates" in precisely the same sense that he does.

The Deputy Chief of Staff for Logistics has a unique position in the Army Staff. He is the advisor and agent of the Chief of Staff and acts through or for him on all logistics matters throughout the Army. He also directs and controls the seven Technical Services that are charged with the control, administration, and management in their respective specialized areas of the materiel and logistical services required to support the Army in peace and war.

All elements and aspects of logistics management come together in the Office of the Deputy Chief of Staff for Logistics. As part of the Army Staff, it participates in joint strategic and logistics planning and in the deliberations leading to decisions as to joint strategic objectives and the supporting tasks of the several Services. It also participates in the development of Army war plans and supporting peacetime objectives. It evaluates logistics requirements and capabilities to support Army force goals and structures and develops time-phased program objectives governing the logistics support of Army peacetime operations and mobilization plans.

As a major command agency, it directs and controls the operations of the Technical Services in support of approved program objectives. It formulates or approves command programs and operating schedules for the Technical Services; prescribes and administers progress reports; and reviews progress in program execution as a basis for corrective action.

(2) **The Army Program System** is the second major member of the Army family of management systems. Although "programming" has become a highly sophisticated term, especially since its association with the higher regions of mathematics, it is simply the rational and efficient phasing of multiple separate actions required to achieve a pre-determined objective. It is as old as the first application of human reason to combine man's talents and the forces of nature to satisfy his wants. It is the essence of strategic and tactical planning. The planning and execution of the D-Day invasion of Europe was probably the most gigantic single programming exercise of all time.

Programming as a specialized system for the direction of peacetime operations was introduced into the Army after World War II. All Army operations were sub-divided among specific functional areas and were assigned objectives integrated with and supporting Army war and mobilization plans. This was followed by a massive staff effort to schedule the activities supporting each program, to formulate and prescribe progress reports, and to review and analyze results. Early efforts accomplished little more than to educate those who participated in them. Largely because of the attempt to program too many activities in too much detail, schedules were frequently out of date before publication. Too numerous and over-detailed programs were inconsistent with the responsibilities of staff agencies and were of little real value to subordinate commands.

During the past few years the program system has been extended into all commands and responsibility for operational programming has been broadly decentralized through command echelons to the installation level. Programs developed at the Army staff level are reduced to five in number: namely, troop, materiel, installations, reserve components and research and development. These five "control" pro-

Two and ½ ton truck, shown here being unloaded by crane from cargo carrier truck, has jeep loaded in truck bed to cut shipping space and costs.

XUM

Supplies are parachute dropped to Infantry in tactical demonstration of Army Aviation supply mobility.

grams contain phased objectives for a five-year period. The documents and related annexes contain such quantitative and qualitative details as are required to be determined by the Army Staff for proper guidance to field commands and are consistent with the assumptions that can usefully be made for the period of time to which they apply.

The Deputy Chief of Staff for Logistics is responsible for two control programs: Materiel and Installations. These programs contain objectives and guidance for the management of all Army real and personal property. Each furnishes quantitative and qualitative objectives governing the acquisition, maintenance, storage, distribution, utilization, and disposal of the property to which it applies.

Programming of current operations is provided for by a system of command programs based upon guidance contained in the control programs and supplementary instructions received from the Army Staff. These programs generally apply to only a single year of operations and are prepared initially about one year in advance of it. They are sub-divided into functional areas corresponding to the subdivisions of the Army budget. They are reviewed by General Staff agencies, accepted or modified where necessary, and used as the basis for the distribution of funds, materiel, and manpower among field commands.

Reporting, review and analysis are prescribed for all command levels from the installation to the Army Staff. Each commander is required to review the progress of his own command and of each immediately subordinate command and to submit the results of his review, with appropriate recommendations, to his immediate superior.

(3) The Army's Financial Management System is the third principal member of its family of management systems. This system is based upon a very comprehensive concept of management formulated by the first Hoover Commission and enacted into law in the 1949 Amendments to the National Security Act. The law provided for the establishment of Comptrollers within the Department of Defense and each military department. It directed that military budgets be submitted and administered on the basis of the cost of performance of functional programs and that capital and operating accounts be segregated. It authorized the use of working capital funds, particularly stock and industrial funds, to facilitate accounting for and control of operating costs.

When and if the law is fully implemented—and we still have quite a way to go—it will have brought about a major revolution in Army management, especially in the management of its logistics resources. Some of its principal effects are already evident:

(a) It has required the installation throughout the Army of a cost accounting system, with a uniform chart of accounts integrated with programming, manpower utilization and other systems governing and accounting for the use of Army resources and the evaluation of results. Installation of this system is only now approaching completion.

(b) It has increased the number of agencies that budget and administer funds and has raised sharply the relative amount of funds administered by agencies that use supplies and services at the expense of the agencies furnishing them. This so-called "consumer funding" requires that agencies responsible for carrying out programs (e. g. training) account for and control the cost of their operations through the formulation of budgets and administration of funds appropriated to support them.

(c) Field commanders are being required to assume responsibility for more comprehensive management of financial resources in addition to their traditional military tasks. Reception of this responsibility—and success in carrying it out—have been far from uniform, but there is encouraging evidence of improvement in both these respects over the past year.

(d) Revolving funds are replacing a large segment of the appropriated funds previously budgeted and administered centrally by the Technical Services. Central procurement of common items is financed by stock funds which are then replenished by sales to using agencies. Inventories capitalized in the Army Stock Fund are currently valued at more than $7 billion and annual sales total more than $2 billion. Increasing numbers of industrial and commercial activities are being capitalized under industrial funds that recoup operating costs through sales to Army and other customers. Currently, 23 installations are operated under industrial funds. This includes arsenals, research facilities, ports, and miscellaneous activities accounting for an annual sales volume exceeding half a billion dollars.

(e) The system as a whole has accelerated the tendency to separate "producer" from "consumer," or alternatively, "wholesale" from "retail" logistics. To some extent, this is one of the penalties of bigness. It should furnish additional incentives for using agencies to apply their resources in a more economical manner and for supplying agencies to improve the man-

agement of their operations through the application of standard business criteria. On the other hand, military leaders must seriously ponder the ultimate effect of these developments on the organization of the Army and the role the several elements of the system will play in a mobilization period. Answers to these questions are not yet clear.

The Army's annual budget occupies the central position within the financial management system. Roughly 60 per cent of the total funds contained in it are for logistic support of all kinds. If pay and allowances are excluded, the logistics portion rises to about 75 per cent. For this reason, I shall not distinguish between the logistics portions of the budget and the budget as a whole.

The budget, when prepared properly and on a reasonable time schedule, is the most comprehensive and thoroughly staffed document produced by the Army. It represents the reconciliation and merger of all three aspects of logistics management, from the fixing of force goals, through control program formulation, to command operating schedules.

The budget formulation and execution cycle encompasses the downward flow through command channels of approved strategic plans and objectives, control programs supporting these plans and objectives, and supplemental guidance; the upward flow of operating programs, workload computation, and cost estimates; the return to commands of approved or modified programs supported by allocations of funds and other resources; and a continuing feedback of progress and utilization reports through the year of operations. Although the cycle is usually compressed because of delays in reaching basic decisions, the budget, to be properly prepared, requires a time schedule within the following limits (in terms of months in advance of the budget year):

(a) Force goals, structure and deployment—15 to 18 months.
(b) Control Programs—12 to 15 months.
(c) Submission of initial estimates—10 to 12 months.
(d) Completion of Army Staff review—8 to 9 months.
(e) Completion of OSD and BOB reviews—6 to 7 months.
(f) Completion of Congressional hearings—3 to 4 months.
(g) Appropriation—2 to 3 months.
(h) Issue of apportionments and allocations—0 to 1 month.

Any close observer of the huge effort that goes into the formulation of a military budget and the salesmanship that must be used in its justification and defense knows the full meaning of the "battle of the budget." Those who use the term in a derogatory sense miss the most important point. The military Services separately and in combination furnish one essential service: the protection of the nation from military aggression. The budget each Service receives reflects an appraisal by the administration, the Congress and the public of the present threats to national security and the role the Service is to play in protecting it. This reflects the significant difference between a military budget and the budget of a private enterprise. Aside from its technical characteristics, it is a submission of proposal by a service-producing agency—a military service—to a prospective client—the Congress and the public.

Package Properly Or Perish

by Col. Lloyd G. Hanley
Director of Supply and Services
Topeka Air Force Depot

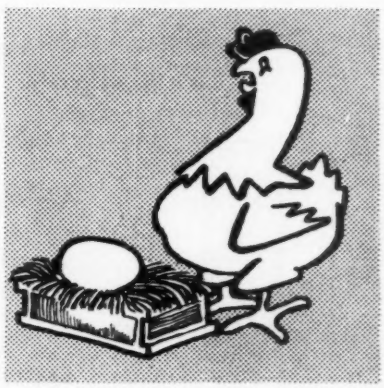
HOW Mother Nature solved some of her packaging problems is shown by the shell of a coconut, the peel of an orange, the husk of an ear of corn, and the shell of an egg. It took millions of years for her to finish these tasks, but we agree she did a rather good job. Through the process of evolution, the plant or animal producing the best package for its fruit or egg survived the rigors of the elements, the attack of disease, and the ravages of insects and animals. Time and cost were of no concern to her. Time, she had plenty of and cost did not enter the picture until an odd-looking creature walking on its hind legs came nosing around.

What does this have to do with the Air Force? First, we don't have a million or so years to perfect a suitable package. Second, this odd-looking fellow has become increasingly disturbed about how deep he has to dig into his pocket to pay for it. Third, Mother Nature did not endow us with limitless resources. The less we use in packaging, the more we'll have for posterity. While each plant or animal is busy producing a package for one product, the Air Force is struggling with thousands.

Packaging in the Air Force is big business. Varying degrees of protection must be used for supplies which range from the smallest screw to a complete aircraft. In a sense, the warehouse itself is the largest package of all.

Ordinarily we think of a package as merely keeping the contents from spilling or protecting an object against damage from handling. Actually, these are but two of the many things the packager has to consider. Moisture, temperature, wind, light, air pressure, static electricity, gravity, magnetism, chemical reactions and varying combinations of these all influence the way an item will be packaged. With these, the type of package is determined from the item's size, shape, weight, composition, value, strategic importance, and how, when, and where it will be shipped, stored, and used. Of utmost importance is the cost of materials and labor consumed in the packaging process. Sometimes the packaging costs more than the item itself. In weighing all these things, Father Time cannot be overlooked. Often, when we need him most, we discover the rascal has run out on us.

By installing large storage tanks, it was found far less expensive to procure and ship alcohol and other chemicals in tank car lots rather than in 55-gallon drums. Shipping thin aluminum sheet rolled in fiberboard drums rather than in large flat plywood crates reduced cost and eased packaging, handling,



and shipping. Providing lighter gauge drums for domestic shipments proved less expensive and served reasonably well. Making maximum use of the commercial pack kept cost to a minimum and assured quicker delivery. In other cases, deviation from the commercial pack proved more advantageous.

Quite different from Mother Nature, but with the same end in view, Air Force packaging people are striving for better and less expensive ways of packing the things we use.

Are You Wasting Money on Noncurrent Records?

Records centers were established throughout the government to save money—it's as simple as that! And, the more you utilize them the greater will be the savings. Here are some clues. . . .

by Robert B. Barker

IF YOU'RE looking for easy ways to economize in this era of reduced budgets, take a new look at your semi-active and noncurrent records. Here you can make tangible savings quickly, with a minimum effort. The Hoover Commission estimates the current government-wide savings potential in the noncurrent records area to be about $18,500,000.

I hope you will not be disappointed at my treatment of this subject since it will deprive you of the glamour of tussling with impressive but abstract management theories steeped with suppositions and generalizations. I am an advocate of simple systems, simple guidelines and simple explanations. Therefore, I would deceive you if I were to mask my data in the guise of complexity. Actually, the Records Center Program precepts are unusually simple, readily understood, and time-tested. But, despite this, we in the Program still have difficulty getting many key administrative personnel to take the few required minutes to learn these precepts—and sometimes even when understood, to take the time to establish an internal system which will effectively implement them.

The creation and maintenance of records is one of the government's largest overhead expenses. To economize, therefore, we must effectively control all facets of this paperwork. Recently, emphasis has been placed upon effective control of current records as a means of achieving large economies. I agree completely with those who campaign for the large savings which will accrue if:

a. Records which are not actually required are not created in the first place.

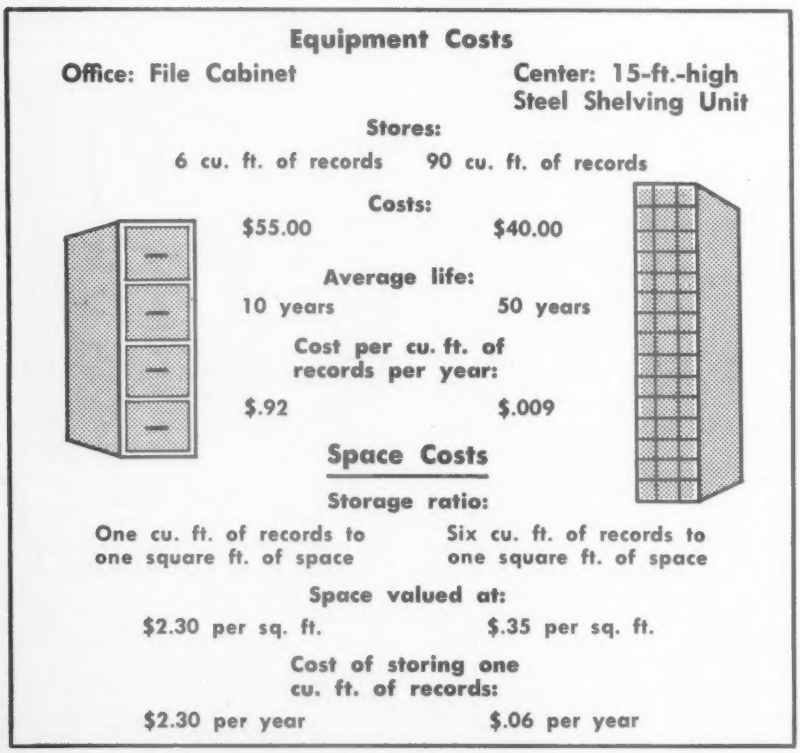
b. Valueless records are never placed in file.

c. Temporary records are removed from file and destroyed as quickly as they have served their intended purpose.

However, it is also very important that we reap the savings which can be derived from effectively controlling our noncurrent records. Remember, even if all of the above current records controls could be completely implemented, there would still remain great masses of essential records which must be retained for four or more years, because of legal or operating requirements. This "noncurrent paperwork" must be correctly stored and serviced to achieve maximum economy. It is about these noncurrent records that I am primarily concerned, as a tremendous tangible saving accrues from storing such records in a records center—and the quicker they get there the better.

Savings resulting from participation in the Records Center Program are real and surprisingly large. For example, the Hoover Commission Task Force on Paperwork Management, January 1955, stated that during 1952-53 a saving to the government of $8,227,000 accrued from transferring records from office space to low-cost records center-type storage space. Also, the government-wide procurement of file cabinets has been reduced from 97,000 in 1951 to only 11,000 in 1954 and cabinets redistributed throughout the government increased from 8,000 in 1951 to 49,000 in 1954. These savings are typical of the current savings being made in the Program.

We in the Records Center Program are not lulled into the belief that our Program will be perpetuated if we don't save the government money and



These simple graphic comparisons illustrate how savings accrue from using center-type equipment and space.

—just as important—if we don't provide unusually high quality service. It is, therefore, the prime endeavor of every Center to provide the activities served with fast and efficient service.

At our Center, we are so vitally concerned about the type of service we are providing our customers that once each year we send a formal inquiry to all of the eighty-four major activities which we serve and ask "if our service during the past year has been entirely satisfactory in every respect and what changes are recommended which may improve our service." Through this medium we hope to constantly improve our service and maintain a close working relationship with our activities.

It may surprise you to learn that records center service is often so good that at some large activities requested file items are received from the Center as quickly as if they were stored in the activity's file room.

Standard record center service policies which insure this excellent service are:

1. Activities never lose control of the records shipped to the Records Center. The originator of the records may restrict access to particular collections of records at any time if special conditions so warrant. Documents, folders, or other file items are returned to the originator immediately, upon request, without question as to purpose.

2. Replies are made to all reference requests within a maximum of eight hours after receipt. Airmail or dispatch replies are made if requested. There is no charge for center service.

3. Reference service is as complete as the requestor wants, i.e., a document, a folder, excerpts of information, an analysis of information and compilation of data, or the answering of letters forwarded by the requestor for direct reply when no new administrative decision is required. Reproduction facilities are available should copies be needed.

4. Records centers do not destroy records without the originator's approval. Upon receipt of records collections from an activity, the Disposal Archivist determines when the records are eligible for destruction and creates a chronological tickler file card. When this disposal date arrives the activity is notified that the records are eligible for destruction, cites the appropriate authority, and only after approval of the originating activity are the records destroyed.

Records Centers can now be operated at an unusually low cost. As an example, NRMC Clearfield, in its excellent facilities, fully maintains and provides all service on about 11,500 cubic feet of records (the equivalent of about 1900 file cabinets) for each employee manyear expended. The total cost of maintaining records at this Records Center, including all employee salaries, administrative and maintenance costs, utilities, etc., approaches only $.43 per cubic foot. The average cost of maintaining similar records in the office area approaches $3.22 per cubic foot for space and equipment alone.

The thought probably occurs to you at this point that there is another large cost, that of transporting records to the Center, which has been excluded from the cost figures. Detailed transportation cost studies have proved that transportation is not an important cost factor in the Records Center Program. Too often people forget that transportation costs are only one-time costs and so are negligible when compared to the larger, annually recurring costs, such as space costs, equipment costs, and personnel costs. To illustrate this let us analyze the average of $.50 per cubic foot charged to ship records from the Bay Area to the Clearfield Records Center. Since the average records stored at the Center are retained for eight years the cost of transportation per cubic foot of records stored at the Center would amount to only $.06 per cubic foot per year. This is obviously very small when compared to office space costs of approximately $2.30 per cubic foot per year and amortized equipment costs of approximately $.92 per cubic foot per year.

Records centers have become increasingly efficient in recent years. Systems are now standardized; layouts are preplanned; operating methods have improved; new, specialized equipment is used; and employee production standards have been established and applied. The large size of the centers and the enormous workload accomplished facilitate the planning of routine backlogs to level the numerous workload peaks and valleys. Operating a records center is a "seasonal business" with great accessioning peaks at the beginning of each calendar and fiscal year and some very lean months in between. Also, the reference services vary abruptly during the week with peaks on Mondays and Fridays and lulls in between. Maximum personnel utilization can be achieved at large centers, but is impossible to obtain in a small, inflexible operation.

In a large records center operation it is economically feasible to purchase specialized equipment to increase operating efficiency. Special equipment includes such things as special lighting fixtures, an electric box-lift machine which will put up or take down 1800 boxes daily, special steel ladders, new, large vaults for storing classified matter, a fork-lift truck, and 15-high steel shelving units. For example, at our Center we store records in 15-high shelving units which makes possible the storage of about one-third more records than usual in the same amount of records center space. This is also exceptional since an office stores only about one-sixth as many records in a comparable amount of space.

When we began experimenting with our 15-high shelving, we were told this would create additional work, increase searching time, and be otherwise impracticable. However, we now have virtually all of our records stored in 15-high units and we are saving money. Our electric box-lift machine is so designed that it puts up and takes down boxes of records in the 10- to 15-high shelves faster than in 5- to 10-high shelves. Also, our Grad-

About the Author

Robert B. Barker is Director of the Naval Records Management Center at Clearfield, Utah. He has also been Head, Management Engineering Division,

Head, Forms, Reports, and Directives Control Division, and Materials Handling Supervisor at the Naval Supply Depot Clearfield.

Mr. Barker received his Bachelor's degree from the University of Utah in Industrial Management and is currently working toward his Master's degree. He has been awarded both the Meritorious Civilian Service Award and the Superior Accomplishment Award for outstanding civilian service. Mr. Barker is Secretary of the Great Salt Lake Chapter of AFMA.

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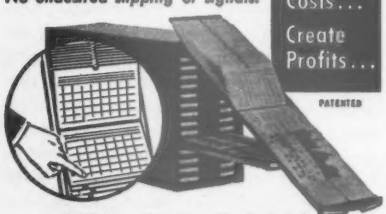

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uated Storage Plan, wherein only inactive, seldom-referenced records are placed in the upper eight shelves in a unit, makes searching in these upper, less accessible shelves, almost negligible. Therefore, there is an overall saving in both time and space by using the 15-high units. Using this 15-high steel shelving and an electric box-lift machine would not be feasible in a small inflexible operation.

To obtain maximum savings, records must be transferred to a records center as quickly as they become semi-active. A common "rule of thumb" for making this determination, which is accepted by both government and industry, is "when records are referred to less than once per month per file drawer it is economical to transfer them to a records center." The precept of this rule is excellent and if it were realistically applied the current goal of having 50 percent of the retained records stored in records center-type space would be achieved. However, few, if any, activities maintain the data required to realistically apply this "rule of thumb." For example, when you're walking through one of your file areas, ask some of your clerks how often they refer to each of the different file drawers in a particular file cabinet. Answers will vary considerably between clerks and, more important, usually vary considerably from the truth since the number of references made is difficult to estimate.

Studies have been made by Navy, General Services Administration, private industries, and others, and all studies indicated that closed-out case files, i.e., files closed out when a given event occurs such as paying a purchase order, settling a claim, closing a contract, completing a project, etc., are seldom, if ever, referred to and so should be immediately transferred to a records center. The National Records Management Council has determined through various analyses that 95 percent of *all* records over one year old are never referred to. Experiments have disclosed that even administrative files which are a year old or more are not referred to more than once per month per file drawer.

The above and other survey data have proved that it is a good general rule to remove records from the office area and transfer them to low-cost, record center-type space "after a maximum of one year plus the year in which they are created." This excellent guide can be readily applied at your activity.

According to the last Hoover Commission Task Force on Paperwork Management, each activity should store about one-half of its total retained records in low-cost records center-type space.

This goal is an average for all types of records and so the actual percentage by activity may vary up or down depending upon the type and size of record collections maintained at the different activities. This goal, however, is realistic and many cost-conscious activities have already either achieved or exceeded it. At the present time only about one-third of the

Box lift machine will put up or take down about 1800 boxes per day with two men operating it.

government's records are stored in records center-type space and so there is a good possibility that your records disposal program needs attention.

The action required by your activity to achieve this 50 percent goal depends upon the extent of your current participation in the Records Disposal Program. Your recent report on volume of records held, together with the listing of the records shipped to records center-type space, maintained by your records officer, will quickly give you this participation information.

At this point, let us review the

evolution of the Records Disposal Program and from this you can determine just how many mileposts your activity has passed.

The Records Disposal Program began as early as 1942, when there was a critical need for additional office space and equipment. Records were stored in a more or less haphazard manner in warehouses just to get them out of the offices. The critical need then arose for some type of guidelines which indicated those records which were worthless and those records which should be retained because of legal or operating requirements. The tremendous job began of developing records disposal schedules for all types of records throughout the defense departments. At the present time, excellent, easily applied records disposal schedules, which tell how long each type of record should be kept, have been developed and approved by Congress for about 99 percent of the Defense Department's records. With the development of records disposal schedules, the Records Disposal Program became widely accepted and publicized and much attention was focused upon the Program the few years following.

Again in 1950, the Hoover Commission revitalized the Program and recommended the establishment of Federal Records Centers in which to house non-Defense Department records. This expanded and further publicized the Program. During one of these promotional years every activity should have established an effective, perpetual Records Disposal Program.

The initial step in the establishment of an effective Records Disposal Program was the appraisal, inventorying, and the application of records disposal schedules to all records collections. During this initial phase of the Program about 30 percent to 45 percent of your total records holdings should have been determined to be worthless and sold as waste paper. After destruction of these records, about one-half of the remaining records should have been determined to be valuable, semi-active records with retention periods specified to be four years or over. These records should have been sent to a records center. The remaining records required for day to day operations were retained in the office area. Do you remember when such a records disposal survey was made at your activity?

After this initial appraisal was completed and all eligible records were destroyed or transferred to a records center, another very important step should have been taken. A system should have been established which insured that at least once each year, on an activity-wide basis, all records were again re-evaluated and the worthless records destroyed and the semi-active, long-term records transferred to a records center. Is this being done at least once each year at your activity?

If your activity has done these things efficiently you should have, at the present time, about one-half of your total retained records housed in records center-type space. To maintain this percentage at a center the Hoover Commission estimates that about 10 percent of each activity's total retained records should be sent annually to a records center. This 10 percent offsets the records which became eligible for destruction during the year at the records center.

You have now been exposed to our Records Disposal Program philosophy. It is up to you to decide how to use it to improve your local Program. To detect areas which should be improved evaluate your activity Records Disposal Program and see if it includes:

1. The appointment of an overall activity Records Disposal Program Coordinator with clearly defined duties and responsibilities.

2. The appointment of records disposal operating personnel in the various departments, divisions, and branches to insure working compliance with records disposal instructions.

3. The issuance of an activity instruction which outlines local policies and procedures for perpetuating the Program. General Program guidelines for disposing and transferring records and also, pertinent records disposal schedules should be included as part of this instruction.

4. The assignment to one organizational segment the responsibility for coordinating and physically shipping all activity records to records centers.

5. Written procedures for obtaining technical assistance in interpreting and applying disposal schedules and other Program guidance from the Records Disposal Program coordinator on a request basis.

6. The annual distribution of promotional data, newspaper articles, brochures, cartoons, statistics, etc. throughout the activity and the complete appraisal, inventorying, destruction or transfer of records as appropriate. This is usually done in connection with the annual "Volume of Records Held" report.

7. The establishment of a cyclic survey program whereby the Records Disposal Coordinator, as part of the regular activity management reappraisal team, makes on-the-site reviews of the records being held by each department. Full authority should be given for reporting noncompliance to the Commanding Officer for action.

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Let's Take the Mystics Out of Logistics

by Major Charles S. Davis, USAF

THE word "logistics" since its original inception has taken on new and greater meaning in military usage. The word in its original sense meant the art and practice of quartering, supplying, and transporting troops.

With increasing complexity of warfare the term in its broadest sense has come to mean the design and development, procurement, storage, movement, distribution, maintenance, transportation, evacuation, and disposition of materiel; the induction, classification, welfare, training, assignment, movement, transportation, evacuation, maintenance, retirement, and separation of personnel; the acquisition or construction, maintenance, operation, and disposition of facilities; the acquisition or furnishing of services; and finally, the planning and implementation of any of these activities. The word in its application must be delimited, implicitly or explicitly, in order to be meaningful in specific situations.

Between the extremes, numerous definitions have arisen. The shades of meaning and connotation have lent an aura of mystery about the word. No single definition of the word, however official it may be, seems to satisfy the needs of all who engage in logistics activities. There is increasing evidence that the word is moving out of strictly military parlance and is finding usage in business. A recent advertisement of a large business firm expressed logistics as "the science of supply" and stated that it is today a vital factor in marketing a specified commodity. This suggests that there is a relationship between the activities involved in carrying out military logistics activities and the business activities.

The word as it stands alone does not in itself describe activities, nor form a ready frame of reference. In order to draw aside some of the mystics and increase understanding of "logistics," we must examine the objectives of the logistic system. We must define the basic functions performed to attain the objectives, and identify the basic means by which functions are performed. Is there some relationship between military logistics and the operation of business? It appears useful to draw some analogies between the two and to compare business activities and terminology with military logistics activities and terminology.

Let us begin by examining the military establishment. The right of existence stems from a recognized need for the particular service. The right to existence carries with it the primary responsibility to provide a service to the nation; that is, a capability to deter potential enemies and to defend the nation during open hostilities.

It should be profitable to the nation in terms of strength and integrity when the need for overt force is manifest, and the objectives must be attained with the greatest efficiency at the lowest possible cost. Using the broadest concept of logistics, these are its basic objectives.

In Business

Turning to the business enterprise, it too receives its general franchise from the people of the nation. The objectives of the business enterprise are to provide a good or service for which the consumer of the product or service is willing to pay a remunerative price. The enterprise, to perpetuate its existence, must discharge assumed or imposed responsibilities to the community within the scope of its operation. It must also provide the means to achieve the personal objectives of its owners, management, and employes. All of the objectives are circumscribed by the need for efficient and economical use of resources. In summary, the objectives of the logistics arm of the military establishment and the business enterprise are to provide a value of some sort, discharge community or social responsibilities, and provide some desired return to ownership.

Some would probably not agree that the military enterprise must carry out its objectives with the same efficiency and economy as the business enterprise. Diseconomies are inherent in the relative contingencies that must be built into military planning, such as capacity for rapid expansion, stockpiling of vast amounts of strategic raw materials, huge reserves of finished goods, a reserve of trained manpower, diversified weaponry, and tactical and strategic dispersal of materiel and forces. Because of these diseconomies the need for efficiency and economy within the military establishment is even more manifest.

The profit motive of the military enterprise is considerably more abstract. The dollar yardstick used to measure the success of business enterprise is not as readily available to the military manager. The only true measure of success or failure of the military enterprise is the outcome of a war. Monetary measures, however, can be an effective guide to the military manager during peacetime operations.

Both the business enterprise and the logistic manager must, if they are to achieve their goals or objectives in the desired manner, proceed through an orderly process of management functions. The administrative, staff, and operative leadership must plan future operations, short and long run; they must define the relationships between functions, individuals, or groups, and the physical factors that combine the various units of executive and operative responsibility; people must be provided the stimulus which will impel action and cooperation toward the attainment of a common objective or desired result; and finally, activities must be regulated in accordance with the requirements of plans so that final objectives are achieved with the greatest economy and efficiency. These activities must be guided by public policy where such exists, and the promulgation or interpretation of internal policy must meet a prescribed code of ethics or standard of conduct.

In summary then, both business management and military management must plan, organize, motivate, and control the activities of their respective in-

stitutions, within the parameters of policy and ethics, in such a manner that the desired logistics and business goals or objectives are attained economically and effectively.

Now let us turn to the activities over which the management processes are exercised. The business enterprise is divided into three basic, or organic, functions, namely, the creation of values, the distribution of those values, and the financing of their operations.

What and how much shall be produced, how it shall be produced, and how it shall be distributed are the economic issues of the business enterprise that are resolved principally by the votes of the consumer in the market place.

Traditionally, the military activities have organized around and described the organic functions as: operations, materiel, comptroller, and personnel. These are the basic functions of the military establishment into which all other functions can be logically and homogeneously integrated, at least conceptually. As in business, the magnitude of activities within the military organization has dictated greater specialization of functions and organizational evolution and devolution for management control purposes. Some may argue that the function, personnel, can be integrated into other more basic functions and rightly so, but it becomes purely an academic issue. The function is of such magnitude in the military scheme that for practical purposes it must be considered and treated as an organic function.

An analysis of the logistics functions, materiel, comptroller, and personnel, shows that materiel is concerned with the several production and marketing functions. Requirements for materiel must be established qualitatively and quantitatively. These requirements must be acquired either directly by internal production facilities or through the production facilities of industry. The materiel must be distributed to the ultimate consumer through wholesale and retail outlets within the logistics system. Time, place, and possession utilities are thus added to the desired values.

Quantitative and qualitative requirements for personnel must be determined. The manpower must be acquired, trained, distributed, and maintained. To effectively administer a personnel program to meet military requirements involves all the basic personnel functions accomplished by the larger business enterprise, but extends further—cultural, spiritual, and physical needs must be satisfied to a greater degree than most business enterprises would normally undertake.

All of the activities described are ultimately reduced to a dollar denominator and must be financed. The comptroller function is in essence the finance activity of the military establishment. Budgetary programs are developed under comptroller guidance, and are consolidated for approval by the Congress, which approximates the board of directors familiar to business parlance. The financial history of the military activities is accumulated, the bills are paid, and a great deal of management data is collected by the comptroller for use by the military commander.

The Customer

The customer of the values provided by the military logistics system is the operational unit, that is, the fighting element of the force. The economic issues of what shall be produced, in what amount, and their manner of distribution are decided more subjectively than in the business enterprise, but the effective military operational desires are more than just economic considerations. However, the basic determinations to be made in both cases are similar. Needs are determined qualitatively and quantitatively, scarce resources must be assembled, these resources must be distributed, and they must be used rationally.

The military and business managers both strive with diligence to achieve an optimal mixture of human and physical resources—men, money, materials, machines, methods, facilities, and markets. The human factors must be combined in an organizational structure which will bring them together with the work and the workplace. The proper balance of procedural guidance and control is exercised so that the objectives are attained in a timely fashion with the lowest possible cost.

Probably no one would disagree that the magnitude, scope and diversity of military operations magnify the complexity of military management. To consider only one aspect of the problem, the combined assets of 23 of the very largest business enterprises in the United States approximates $54 billion dollars, the assets of the United States Air Force alone is estimated to be $75 billion. The task is not only complicated by sheer size, but is further compounded by a host of imponderables and variables that cannot be predicted with any degree of accuracy. Errors in judgment occurring in the military establishment become magnified many times their relative proportion if committed in industry.

The essential ingredients of the business and military logistics community are the same. By establishing objectives that are attainable and capable of quantification, reducing the management problem into smaller manageable divisions, and by exercising proper control, the management task of the Armed Forces can be better brought into focus.

Professional Services

This is an exclusive feature to aid the services in obtaining highly skilled personnel, GS-9 rating and above. Vacancies shown are official releases from the offices concerned. Apply direct to the installation where the vacancy exists. For information about other jobs visit or write the nearest military installation.

Rome Air Force Depot
Griffiss Air Force Base, New York
Electronic Engineer (Radio) GS-11
Freight Traffic Officer (2) GS-9

Navy Overseas Employment Office
(Pacific) Section A
45 Hyde Street
San Francisco 2, Calif.
Electronics Engineer GS-13
Electronics Engineer GS-11
Industrial Engineer GS-11
General Engineer GS-9

Industrial Manager, USN, Ninth Naval Dist.
and
Supervisor of Shipbuilding, USN & NIO
Great Lakes, Illinois
Supervisory Ordnance Engineer GS-13
Supervisory Ordnance Engineer GS-12
Supervisory Elex Engineer GS-12
Supervisory Elex Engineer GS-12
Electronics Engineer GS-11
Supervisory Elex Engineer GS-12
Supervisory Elex Engineer GS-12
Electronics Engineer GS-11
Electronics Engineer GS-9

2nd Coast Guard District
St. Louis, Missouri
Electronics Engineer (Radio) GS-9

3rd Coast Guard District
New York, New York
Civil Engineer GS-11

5th Coast Guard District
Norfolk, Virginia
Electrical Engineer GS-11
Electronics Engineer (Radio) GS-9

7th Coast Guard District
Miami, Florida
Electrical Engineer GS-11

9th Coast Guard District
Cleveland, Ohio
Civil Engineer GS-9

11th Coast Guard District
Long Beach, California
Civil Engineer GS-11

14th Coast Guard District
Honolulu, T. H.
Civil Engineer GS-9

XUM

Manpower—
From Source to Uniform

by C. S. Rice

AGAIN and again it becomes more clearly evident that today's so-called push-button era of warfare only complicates the manpower problem of the Armed Forces. The complicated gear of the air arm of the 1950s calls not only for masses of young men and women, but for youthful airmen of an intelligence far above that of the lad who could tie up some horses to a picket line in the 1850s. Today's picket line is a mass of electronic mechanisms.

How will the willing, the reliable, the potentially skilled support craftsmen be brought from city and village to the Air Force base?

One way: By *persuasion* . . . tantamount, or leading to, a sale.

What about the means of delivering this consent? Man's history and progress have confirmed the fact that the motivation of human beings is accomplished best by personal contact. Within this personal-contact area, then, is the prime method of moving the nation's young men into USAF uniforms. It may be a word from father, mother, or friend; most likely it will be the Air Force recruiter's words.

To create a favorable climate of public opinion throughout the country, to aid the recruiter in his personal contacts, and, if possible, to "pre-sell" the youngster before he approaches the recruiting office—these are the goals of the recruiting advertising program carried out by the Air Force.

In entering the command post of persuasion one begins to deal with *impact*, with *impression*, with *exposure* (all of a positive aspect). If impact can be obtained, it is the most desirable; impression may lead to impact; and exposure also may be improved by repetition or new approach.

What are the weapons for the strategy and tactics to be employed? They are television, radio, and the printed word and picture—in magazine, newspaper and "sales aid" (brochure, pamphlet, or folder).

Now comes the question of weapon capabilities and characteristics, provided the media (weapons) are available within amounts of money appropriated. Indeed, if no military commander ever has the quantity of men and materiel he would like for his impending struggle, neither has the Air Force today *carte blanche* to inundate the communications outlets of America with messages prompting young men to fill the ranks for four years and for 30 years.

Fortunately, the words "public service" open almost magical opportunities. For the procurement of men for the Air Force they mean hundreds of thousands of dollars of free time on the airwaves and also space in publications to some extent.

Today on approximately 500 TV stations, the contrail of a jet will race across the receiver screen while a voice barks out the selling points of service in Air Force blue. In these instances, only production of the actual "commercials" was necessary. The one-minute films are very costly, however, and they must compare favorably with the best that private industry can offer. Air Force films produced for internal purposes often may be screened on television too, but, of course, they do not contain recruiting messages.

Radio provides a different situation. Programs are placed on recordings and sent to the stations for broadcast. The Air Force Band produces one program; popular records are combined with voiced material and utilized for others. Recorded spot announcements are also used.

Magazines and newspapers do not follow the pattern of providing public service support in the manner of the Federally licensed broadcasters, except on occasion. However, individual advertisers will donate space sometimes or, more often, place a small recruiting message in their ads. It is in periodicals that Air Force advertising space is purchased, but only to reach specific target groups.

The recruiter "salesman"—and he's officially called that—gets a big assist from the sales aids. These may be football schedules with rather inconspicuous recruiting matter or straight folders on career opportunities.

The Air Force obtains talent in depth to carry out the recruiting advertising program. One of the larges advertising agencies in the country, under a contract competitively awarded, offers "know-how" in the form of advice and guidance, along with creative and production services.

But the program is not solely the end-product of the contract agency. Sales aids and transcribed radio programs are produced too by a military agency, the Recruiting Publicity Center on Governors Island in New York harbor. Jointly manned by Air Force and Army personnel—the Army is executive agent—it produces for both services. The Center's products include the traditional recruiting poster seen for so many years across the land.

The job that the promotional campaign supports is assigned to the 3500th USAF Recruiting Wing, with headquarters at Wright-Patterson AFB. Six recruiting groups divide jurisdiction over the country and have a total of 71 detachments.

Contacts are made at over 800 recruiting offices, no longer tagged recruiting stations—perhaps appropriate when one considers the finesse needed for modern-day recruiting.

A small branch of Headquarters USAF plans and oversees the Air Force recruiting advertising program. Within the Personnel Procurement and Training Directorate, this office daily ties together the many varying aspects of Manhattan's advertising row and echelons of the Pentagon—a marriage of necessity.

It all adds up to a massive campaign waged with constant vigil—a battle for attention. When the supremacy of attention is obtained, even for a moment, then *persuasion*—victory in its ultimate form—is at hand for the recruiting mission: young men seek out Air Force recruiters.

And so an Air Force is kept in being.

About the Author

Mr. C. S. Rice is the Information Specialist in the Recruiting Advertising Branch, Hq USAF. A civil servant since March 1951, he was with the Department of the Army before assignment to Air Force Headquarters in March 1954. His experience in the broadcast and publication fields was gained principally in New York City and Washington, D.C. He served during World War II as a noncommissioned officer with the Armed Forces Radio Service short-wave radio activity and with Hq Newfoundland Base Command.

Your Investment Future

Within the next few years there will be some startling changes in your way of life—

AMERICAN INDUSTRY BUILDS FOR YOUR FUTURE

by W. Mac Stewart
Vice President, Research
Hamilton Management Corporation

Anyone who closely follows market reports and economic forecasts is already full "up to here" with the myriad of comments on the present adjustment period and predictions for the next year—many of them contradictory. So what are we to believe? To get the true picture, we must dig deeper and look farther ahead. We must go behind the scenes—into the factories, the laboratories, the executive offices of that gigantic machine we call "American Industry." Anyone who spends full time, day after day, studying industries, individual companies, and our changing economy, cannot fail to be impressed with several major points:

Right now, industry is taking a long look ahead, and is realigning its sights. While production has been curtailed in certain fields, there has been no slackening of research and development. Work is moving ahead full steam on the drawing boards, in the laboratories, in plants throughout the nation. Industry is improving and refining existing products, developing a constant stream of new products. It has been estimated by some industrialists that 25% of the products that will be manufactured ten years from now are products *not now on the market.*

Look, for example, at the communications field. In the space of a few short years we have come from Marconi's first crude wireless, Bell's homemade telephone, Edison's talking machine . . . to today's complicated color television, radar signals to the moon, and telemetry systems in artificial satellites. The coming years will bring video phones into our homes, 3-D television pictures on our walls . . . and who knows what else? The same is true in all major industries.

Yes, housing is another good example. The buildings of tomorrow will utilize different materials, different lighting, different heating. Cities will stretch for a hundred miles or more. Thousands of miles of new super highways will be needed.

Economical harnessing of nuclear and solar energy will open whole new fields . . . will supply more cheap power than we can use. And all this will lead to even more scientific advances—more new products and services to take care of a constantly growing population. And as our standards of living improve, the American people will demand more and more from American industry.

Industry is already planning and gearing for the tremendous role it will play in the coming "space exploration age." For example, right now, while some gloom purveyors are talking about "recession," industry is spending, or has projected, over $36,000,000,000 in capital improvements for 1958. During this year American corporations will invest $10,000,000,000 in the securities of *other* corporations. Long term confidence? Certainly! Depression? Hardly!

In 1957 the Gross National Product (total value of all goods and services produced) was $435,000,000,000. It is estimated that the GNP will reach $650 billion in 1970, and a TRILLION dollars in the 1980's! And on the stock market, the Dow Jones Industrial Average, which hit an all-time high of 521.05 in April, 1956, and is now riding in the mid-400's, should break 700 by 1960, and could be in the 1000's by 1970.

"This all sounds wonderful," you may say, "but what does it have to do with me?" Just this: The forward-looking man will cut himself a piece of it. He will make himself a part owner of the production capacity that will make possible all the new products and services. He will share in the profits from them, and protect himself from the inflation that is certain to accompany this progress. Let's look backward for a moment. If you had made an investment in a selected cross-section of American industry (as represented by the portfolio of some of the high-grade common stock mutual funds) just ten years ago, with dividends reinvested, your money would have about *tripled* by now. But with the accelerated rate of progress now being experienced and anticipated for the future, it is logical to expect even better results. It is not unrealistic to expect that such an investment made now could easily grow 500% in the next ten years . . . or be worth up to 25 times its original value in 20 years!

My sincere advice to you is to prepare for the future by growing with American industry, and sharing in its profits. If you have the financial resources to diversify your investments broadly, and retain a competent investment counselor, fine. Or if you have the training, research facilities, and time to thoroughly evaluate many securities and continually watch your

Interested in a

COMMON STOCK INVESTMENT PLAN?

You can share in the ownership of over 80 major corporations in 20 basic industries, by lump sum investment or by monthly investments of $10 or more. Objectives are both current income and future growth.

Hamilton Funds
Dept. E1
Box 4210, Denver 9, Colo.
Please send prospectus-booklet without obligation.
Name
Address
City State

For more facts request No. 110 on reply card.

Keystone Fund of Canada, Ltd.

A fully managed Mutual Investment Company seeking long-term CAPITAL GROWTH in the expanding Canadian Economy

The Keystone Company
50 Congress Street, Boston 9, Mass.
Please send me prospectus describing the Keystone Fund of Canada, Ltd.
Name
Address
City State
B-88

For more facts request No. 111 on reply card.

investments, fine. But if you haven't, depend on one of the many good common stock investment funds, where you are, in effect, hiring experts to do the job for you. Of the more than 200 registered funds, over half of them are either common stock funds or balanced funds with the greatest majority of their holdings in common stocks. Most of them have done a very capable job in the past, and can be expected to do so in the future.

A word of caution: Don't draw the dividends from your investment. Let them accumulate, buying more shares. In that way you have the effect of quarterly compounding, earning dividends *on* dividends, building for your future.

And a final bit of advice: Invest as much as you can afford in the immediate future—the next five years, and particularly in the next year or so while securities prices are at an attractive low level.

If you start now on a sound, consistent program of accumulating ownership interests in American industry, you can face the long-range future with the same confidence that is being expressed by America's leading scientists, economists, and industrialists. Now is the time to use the foresight you *wish* you had used ten or twenty years ago!

Run Down of Key Contracts

Army

$51.5 million to **Food Machinery and Chemical Corp.** for additional amphibious M59 armored personnel carriers.

$1,053,428 to **Correct Craft, Inc.,** for recently standardized plastic assault boat.

$13.2 million to **Raytheon Mfg. Co.** for Hawk missiles and components (includes estimated 20% of subcontracting for missiles and supporting ground equipment still in prototype stage).

Navy

$26 million to **Convair Div.** of General Dynamics Corp. for guidance and control groups for the Terrier surface-to-air guided missile.

$6.36 million to **General Electric Co.** to construct the propulsion machinery for three nuclear-powered Fleet Ballistic Missile submarines (includes propulsion turbines and gears, turbine generators).

Subject to acceptable contract negotiations, **Electric Boat Div.,** General Dynamics Corp., to build two of the three Fleet Ballistic Missile nuclear-powered submarines (the other to be built at the Navy's Mare Island Naval Shipyard).

$18.3 million to **General Electric Co.** for J79 jet engines.

$18.6 million to **Westinghouse Electric Corp.** to design and furnish reactor compartment components for Navy's three nuclear-powered FBM submarines.

$85 million (total of three awards) to **Defoe Shipbuilding Corp., Bath Iron Works,** and **Todd Shipyards** for total of five guided-missile destroyers.

Air Force

$4.9 million to **Lear, Inc.** for flight attitude indicator systems.

$3 million to **Reaction Motors, Inc.,** for service test of a quantity of liquid fuel rocket engines.

$3 million to **Collins Radio Co.** for aircraft navigation equipment.

$4.5 million to **Cessna Aircraft Co.** for additional L-27 airplanes.

$11.4 to **Lockheed Aircraft Corp.** for T-33 jet trainers.

$1.13 million to **Hycon Mfg. Co.** for supersonic aircraft reconnaissance camera.

Advertisers' Index

Aerojet-General Corp. 1

Borg Equipment Div., The George W. Borg Corp. 24, 25

Brown, Madeira & Co. 7

Caterpillar Tractor Co. 6

Certified Scheduled Airlines of the U.S.A. .....Cover 3

Continental Motors Corp. 4

CONVAIR—A Div. of General Dynamics Corp. .....Cover 4

Equipto Div., Aurora Equipment Co. 48

Graphics Systems, Inc. 42

Hamilton Management Corp., The 33, 47

Keystone Co. of Boston, The 47

Lockheed Aircraft Corp. 2

Radio Corporation of America..Cover 2, p. 11

Stran-Steel Corp. 19

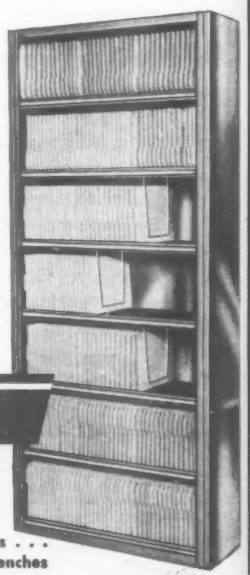
Tapecoat Co., The 43

Wassell Organization, Inc. 7, 30, 33, 42

increase filing capacity 100%

Equipto

SHELF FILE



One Equipto Shelf Filing Unit holds 21 linear feet of files . . . Over NINE standard drawers full! . . . Yet takes only 3 sq. ft. of floor space. Costs only a FRACTION of any other method.

Saves time and effort. No need to pull heavy drawers open. Patented spring steel rod followers on every shelf are adjustable and lock at any spot to provide compression. Get all the details NOW . . . Write for Equiptogram No. 167-A.

Equipto

614 Prairie Ave., Aurora, Ill.

Manufacturer of World's Finest Steel Shelving . . . Parts Bins . . . Drawer Units . . . Lockers . . . Carts . . . Work Benches

For more facts request No. 106 on reply card.

New Products

Lead Items This Month

(For more information, see advertisers' index)

How to Use AFM Prepaid Reply Card

In this issue, a postage free card is provided for your convenience in requesting descriptive and informative literature. This will be forwarded to you, without obligation. Many cost saving ideas are generated by Operating Departments that have information on products available. Purchasing Officials will find this type of information invaluable. Just fill in name, address, circle number required and mail. Descriptions sent to AFM direct from the supplier.

Corrosion Combatant

The Tapecoat Co. **Tapecoat, a coal tar coating in tape form, combats corrosion and abrasion on pipe, pipe joints, fittings, couplings, tanks, tie rods and conduit buried in the ground, comes in six different roll widths from 2 to 24 inches.**

For more facts request No. 100 on reply card

Visual Control Board

Wassell Organization, Inc. **Produc-trol not only schedules but automatically checks with time, line, and color control, has low original and up-keep cost.**

For more facts request No. 101 on reply card

Boardmaster Control

Graphic Systems. **This firm reports men interested in efficient management can get things done with Boardmaster Visual control which gives a graphic picture of operations, spotlighted in color, saves time, money, and stops errors.**

For more facts request No. 102 on reply card

Inventory Control

Wassell Organization, Inc. **Lists 16 reasons why you should be cutting costs and speeding efficiency with the simplified inventory control, Sig-na-lok. Visible control puts inventory at your fingertips.**

For more facts request No. 103 on reply card

Visual Control Board

Wassell Organization, Inc. **The new Vu-board, which shows all important data, sets up and operates easily, has unlimited uses for scheduling, charting, dispatching, etc., is offered at low cost by this firm.**

For more facts request No. 104 on reply card

Steel Housing

Stran-Steel Corp. says you can own this all-steel, all-purpose warehouse at *less* than your present rental cost with permanent all-steel Stran-Master—at prices 30-50% less than most other types of construction.

For more facts request No. 105 on reply card

Shelf File

Equipto claims a 100 percent increase in filing capacity with Equipto shelf filing units—claims they need only three square feet of floor space to handle nine standard drawers full of material. Write for Equiptogram No. 167-A.

For more facts request No. 106 on reply card

Electronic Components

Borg Equipment Div., the George W. Borg Corp., suggests a way they believe you can save time and money when faced with design or production problems of electronic components; suggest you obtain a copy of catalog BED-A90 today.

For more facts request No. 107 on reply card

New Services

Filing Manual

Wassell Organization, Inc. **A free booklet on filing is being offered by this firm, contains in charts and illustrations some answers to questions such as the space problem, how to eliminate congestion, comparison of three filing methods.**

For more facts request No. 108 on reply card

Mutual Fund

Brown, Madeira & Co. **For persons interested in starting a personal investment program this firm offers conservative type, middle-of-the-road type, or aggressive type investment. Firm specializes in Mutual Investment Funds.**

For more facts request No. 109 on reply card

Investments

Hamilton Management Corp. **Through Hamilton Funds, Inc., a managed common stock investment fund, this firm offers lump sum or monthly investment plans to fit any budget. Interested persons can inquire without obligation. Firm recently declared another quarterly dividend.**

For more facts request No. 110 on reply card

Capital Growth Fund

Keystone Fund of Canada, Ltd. **Eastern investment firm offers capital growth long-term investment in the expanding Canadian economy.**

For more facts request No. 111 on reply card

Other New Products

PORTABLE RECORDER: A self-contained, battery operated recorder has been announced by the Stancil-Hoffman Corp., one of the pioneers in this field. Weighing 13 pounds, the "MINITAPE" recorder is available at any of the standard type speeds, transistor amplifiers are on printed circuit plug-in assemblies.

For more facts request No. 1 on reply card

COUPLINGS: Having a wide range of military applications, Metro-Flex couplings

No Postage Stamp Necessary If Mailed in the United States

Postage Will Be Paid by Addressee

BUSINESS REPLY CARD

First Class Permit No. 2455-R (Sec. 510 P.L.& R.) Washington, D. C.

ARMED FORCES MANAGEMENT
1001 VERMONT AVENUE, N.W.,
WASHINGTON 5, D. C.

READER SERVICE DEPT.

XUM

(made by Metron Instrument Co.) handle angular misalignment of driving and driven shafts up to five degrees, parallel offset to as much as 0.010 of an inch and axial end play up to 0.090 of an inch, provide constant rotational velocity, transmit high torques up to 150 ounce-inches, permit speeds to 10,000 rpm, minimize backlash.

For more facts request No. 2 on reply card

GEARS: Design Corp. now offers for the first time anywhere, a complete line of stock A.G.M.A. Proc 2 fine pitch spur gears. An individual PIC "True-Blue" Gear Tape is included at no charge with each Precision 2c gear to certify and verify its accuracy.

For more facts request No. 3 on reply card

NEW RELAY: A new relay, No. 325 ST, has been introduced by the Electro-Mechanical Specialties Co., Inc. This new unit has been designed to meet the stringent requirements of airborne and missile applications, per MIL-R-6106. Temperature range from minus 65 to plus 125 degrees centigrade.

For more facts request No. 4 on reply card

GEAR BOX: A super-speed gear box whose gears reach rotative speeds in excess of 420 miles per hour has been designed and manufactured by Western Gear Corp. for testing missile pumps. Built for permanent installation, the precision gears of the two-speed box (see cut) turn over at 67,000 rpm with a pitch line velocity of 37,303 feet per minute.

For more facts request No. 5 on reply card

HYDRAULIC PUMP: A new variable delivery, variable pressure, hydraulic pump (developed for missile launching and test stand applications) capable of pressures to 5000 psi has been announced by Vickers Inc. The pump has passed an Air Force 1000 hour qualification test (MIL-S-26874 and 26877) requiring operation at 5000 psi for more than 10% of the test time. During the test, the unit completed in excess of 23,000 duty cycles from zero flow to full flow.

For more facts request No. 6 on reply card

INDUSTRIAL-TYPE EQUIPMENT: Precision Equipment Co. has just released a 16-page industrial equipment catalog for executive planning "studied by 92% of America's most successful executives" which may be of value to military commanders concerned with efficiency and modern material handling and storage equipment.

For more facts request No. 7 on reply card

FREQUENCY DETECTORS: Waugh Engineering Company's new FD-100 series Frequency Detectors will provide instantaneous cut-off when the speed of rotating devices exceeds a preselected value. Response time within 10 milliseconds, as well as high reliability, is achieved through the use of transistor switching. The absence of mechanical contacts assures unlimited life and trouble-free operation under extreme shock and vibration.

For more facts request No. 8 on reply card

RELAY ELIMINATOR: The Model 530 "TREPAC" (Teleprinter Relay Eliminator Package) is the first of a series of transistorized keyable switching devices that Trepac Corp. of America has designed to replace conventional electro-mechanical relays. The units, packaged as small plug-in type devices, consist principally of power transistor circuits with silicon diodes and built-in rectifiers which enable them to be powered directly from the 115v, 60 cps line. Virtually maintenance-free, the units have passed rigid testing by government agencies.

For more facts request No. 9 on reply card

WATER-RESISTANT ADHESIVE: A new water-resistant, colorless adhesive which possesses properties in excess of those required by military specification MIL-A-3941 for bonding and protecting labels on a variety of container surfaces is now available from Adhesives, Coatings and Sealers division, Minnesota Mining and Manufacturing Co. Designated EC-1341, this synthetic resin base, transparent adhesive is designed for bonding paper labels to fiberboard, wood, steel and galvanized iron surfaces.

For more facts request No. 10 on reply card

LADDER CATALOG: 140 types of wood and metal ladders, several climbing accessories, plus an efficient price list are included in American Ladder Mfg., Inc.'s new 40-page illustrated catalog. Its pages display ladders, scaffolding and planks for construction, trade, and industrial use.

For more facts request No. 11 on reply card

PRODUCTS BROCHURE: A new 46-page brochure setting forth the design, engineering, and manufacturing facilities, and showing typical electro-mechanical and electronic products and systems in the fields of power supplies, actuators, blowers, timing devices, and inverters as used in the manufacture of aircraft and missiles has been issued by Western Design & Mfg. Corp.

For more facts request No. 12 on reply card

ADVANCED TWO-GYRO MASTER REFERENCE: Lear, Inc. has announced a new two-gyro stable platform which provides all-attitude reference signals to the autopil... attitude indicating, navigation, bombi... fire control and radar systems of advanc... multi-Mach aircraft. The Lear model 21... is the smallest, lightest and least expensi... central master reference ever built for hi... performance aircraft, is in production f... use in both USAF and Navy jet aircraft.

For more facts request No. 13 on reply ca...

SPEEDS MACHINE POSTING: The mo... tedious and time-consuming part of machi... posting—forms insertion and collation... has been eliminated by a new Automat... Line Finder offered by the Monroe Ca... culating Machine Co. for all accounti... machines in its "President" Series. Th... Line Finder instantly positions as many ... three forms both horizontally and to th... correct writing line for immediate positi...

For more facts request No. 14 on reply ca...

NEW PRODUCT SUMMARY: A new 1... page product summary and price list, ju... announced by National Research Corpor... tion, lists a complete line of standard an... custom high vacuum components, equipme... and systems. Described as the most com... prehensive listing of laboratory and i... dustrial vacuum facilities available toda... it includes all types of mechanical an... diffusion pumps, gauges, valves and a... cessories such as connectors, switches an... feed-throughs.

For more facts request No. 15 on reply ca...

SOLDERLESS CONNECTORS: An entir... new line of solderless HYFEN connector... and related crimp-type installation tooli... will be introduced by the Burndy Corp. a... the I.R.E. show in New York in lat... March. In information released recentl... Burndy said the new connector line is de... signed to speed the wiring of electroni... and missile harnesses and add greater de... pendability by utilizing crimped pins an... sockets that snaplock into a plug or re... ceptacle.

For more facts request No. 16 on reply ca...

SPECIAL DIRECT CURRENT MOTOR... AND GENERATORS FOR MILITARY AP... PLICATIONS: Bulletin GED-3343, 8 page... describes how General Electric can hel... solve special D-C motor application probl... lems—outlines complete engineering serv... ice, typical equipments manufactured fo... non-standard applications including missil... support equipment, ground power unit... dynamometers, electric truck motors an... others for special requirements.

For more facts request No. 17 on reply ca...

NEW DIRECT READING SPECTROMETER... A new direct reading spectrometer devel... oped by the Jarrell-Ash Co. complete... analysis of both ferrous and nonferrou... metals and alloys within 30 seconds—an... instantly registers concentrations of up t... 30 alloying elements simultaneously on easy... to-read dials.

For more facts request No. 18 on reply ca...

NEW INSTRUMENT PANEL CLOCK: De... sign Corp. offers a new instrument pane... clock manufactured and finished to MI... specifications for photographic, recordin... and instrument applications. The unit i... manufactured to strict shock resistan... specifications for use in guided missile ap... plications and is guaranteed waterproo... and chemical resistant.

For more facts request No. 21 on reply ca...

TEMPERATURE INDICATING CRAYONS... Tempil Corp. offers a complete line o... Tempilstiks—temperature indicating crayo... for instantly detecting faulty steam trap... without the need of disconnecting the... trap.

For more facts request No. 22 on reply ca...

NAME_____

TITLE/POSITION_____

COMPANY_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

Card cannot be processed unless all information is given. Please limit requests to ten items.

Armed Forces Management
Reader Service Dept.
MARCH, 1958
Expires
MARCH 31, 1958

CIRCLE NUMBERS BELOW FOR INFORMATION ON PRODUCTS.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75
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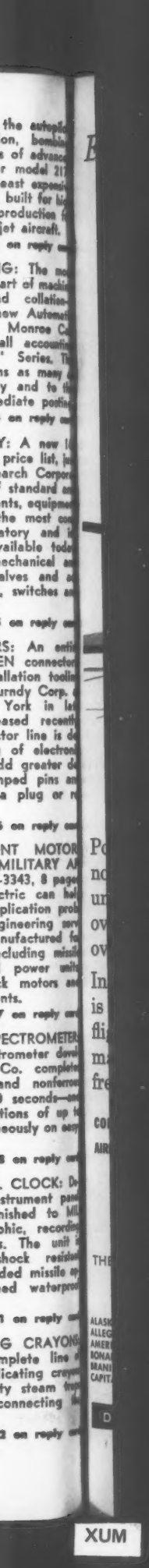

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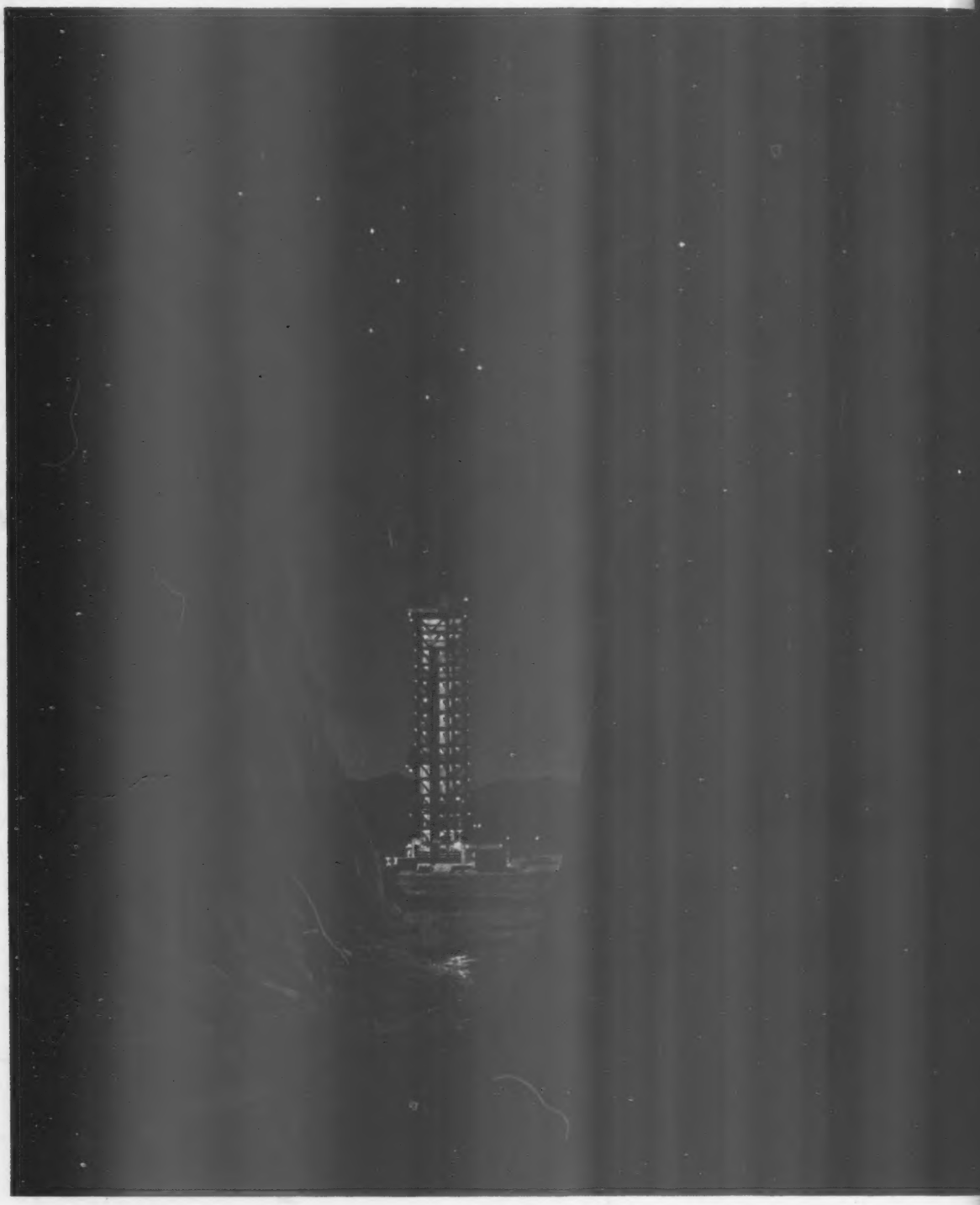

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